

the

ACCESSIBLE
portapack
manual

1974-

1984

DEAR FRIENDS -

HERE'S A PHOTOCOPY OF THE MANUSCRIPT FOR OUR 'ACCESSIBLE PORTAPACK MANUAL'. WE HOPE TO DISTRIBUTE THE FINAL VERSION FREE, ON 3-RING BINDER PAPER.

THIS IS THE TEXT ONLY - THE MANUAL WILL CONTAIN DRAWINGS, PHOTOGRAPHS AND A LESS COMPACT LAYOUT.

PLEASE, AS YOU GO THROUGH IT, MAKE NOTES ON THINGS THAT NEED CORRECTION OR SHOULD BE CUT OUT, ANYTHING THAT'S NOT CLEAR, AS WELL AS CONSTRUCTIVE CRITICISM FROM YOUR GENERAL IMPRESSION.

HERE ARE SOME COMMENTS ALREADY RECEIVED:

- "BY USING DIFFERENT WRITING STYLES, MAKE A CLEAR SEPARATION BETWEEN BEGINNERS' INFORMATION AND MORE COMPLEX SECTIONS FOR PEOPLE ALREADY INTO IT."

- "WHEN TRACING TROUBLES, ONE PERSON SHOULD CHECK EVERYTHING OUT. IF A BUNCH OF PEOPLE ARE TRYING TO FIGURE OUT WHAT'S WRONG, IT JUST GETS MORE CONFUSING."

- "SEPARATE YOUR PERSONAL OPINION FROM FACTS + TECHNICAL INFO."

- "RE. PAGE 7A (4 LINES ABOVE REFERENCE #6). BY PULLING ON THE WIRES IT IS MORE LIKELY THAT THE WIRING WILL GO OPEN-CIRCUIT."

IF YOU ARE WILLING, ADD ANY INFORMATION YOU THINK WOULD BE USEFUL, AND DO HELP WITH THE DEFINITIONS.

I FEEL THIS MANUAL IS ALREADY THE RESULT OF OUR COLLECTIVE EXPERIENCE. PLEASE HELP GET IT TO THE SPACE OF TURNING OTHER PEOPLE ON TO USING THE PORTAPACK WELL.

LOVE,
Michael

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INTRODUCTION

BECAUSE OF ITS RELATIVE LOW PRICE, SMALL-FORMAT VIDEO HAS SPREAD QUICKLY AROUND THE INDUSTRIALIZED WORLD. VERSATILE AND EASY TO LEARN, THE PORTAPACK HAS NURTURED THE CONCEPT OF ACCESS, OF SHARING THIS RESOURCE BY MANY PEOPLE WITH VARIOUS VIEWPOINTS AND INTERESTS. THIS RADICALLY CHANGES THE TELEVISION PROCESS, TAKING COMMUNICATIONS MEDIA OUT OF THE HANDS OF PROFESSIONALS AND CREATING A NEW MIRROR OF SOCIETY.

COMMUNICATION IS A RIGHT WHICH MUST BE EARNED IN A WORLD WHERE PEOPLE CAN CHOOSE NOT ONLY WHAT THEY READ BUT ALSO WHAT THEY WATCH AND LISTEN TO. THE MESSAGE MUST SPRING FROM FELT VALUES; IT MUST ALSO BE COMMUNICATED WELL. IF WE CHOOSE TO MAKE USE OF THIS MEDIUM, WE SHOULD LEARN ITS TECHNIQUES, ITS POSSIBILITIES AND LIMITATIONS, AND TREAT IT WITH CARE TO GAIN THE BEST USE OF IT.

I HOPE THIS MANUAL WILL HELP FOSTER THE GROWTH OF A NEW COMMUNICATIONS ENVIRONMENT FROM THE BASE UP. IT CENTRES AROUND THE SONY AV3400, BECAUSE IT IS WIDELY AVAILABLE AND FRANKLY WHAT I HAVE USED MOST; HOWEVER I WOULD NOT RECOMMEND THIS PORTAPACK OVER THOSE OF ANY OTHER MANUFACTURE. THIS IS NOT AN INSTRUCTION BOOK FOR SOMEONE USING THE PORTAPACK FOR THE FIRST TIME; IT SHOULD RATHER SERVE TO SUPPLEMENT AN INTRODUCTORY WORKSHOP GIVEN IN PERSON. I'VE INCLUDED MUCH INFORMATION FOR REGULAR USERS AS WELL, THE RESULT OF THE COLLECTIVE EXPERIENCE OF MANY FRIENDS.

Michael Goldberg

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THIS MANUAL, OR ANY PORTION
OF IT, MAY NOT BE SOLD OR
PUBLISHED. FREE CIRCULATION
ONLY.

THIS PORTION OF WORK ON THE MANUAL HAS BEEN
COMPLETED WITH THE FINANCIAL ASSISTANCE OF:
THE EDUCATIONAL RESEARCH INSTITUTE OF B.C.
THE PROVINCIAL EDUCATIONAL MEDIA CENTRE
WITH THANKS TO THE ENCOURAGEMENT OF MANY FRIENDS
AND DONNA'S PATIENCE. (IT'S NOT OVER YET!)

TO SHOW 1/2" VIDEOTAPES YOU NEED THE FOLLOWING EQUIPMENT:

- T.V. SET, OR
- VIDEO MONITOR
- (IF FOR USE WITH PORTAPACK, IT MUST HAVE AN 8-PIN RECTANGULAR INPUT, OR V.H.F. ANTENNA SCREWS.)

- + PORTAPACK (CANNOT BE USED FOR ONE-HOUR REELS), WITH
- AC ADAPTER, OR
- BATTERY
- EMPTY REEL INSIDE THE DECK
- 8 ↔ 10 PIN CABLE (FOR MONITOR ONLY), OR
- R.F. ADAPTER (FOR T.V./MONITOR)

- MAKE A LIST OF BORROWED TAPES
- IF THE BORROWER KNOWS HOW TO USE IT - INCLUDE A CLEANING KIT

PHOTOCOPY THIS PAGE AND INCLUDE IT WITH THE PORTAPACK WHEN LENDING IT OUT FOR PLAYBACK.

Ⓐ POWER - WITH THE SWITCH OFF, CONNECT THE AC-3400 (AC ADAPTER) TO THE LEFT SIDE OF THE PORTAPACK. IT GOES INTO THE JACK ON THE LEFT; WITH THE NOTCH FACING THE BACK OF THE V.T.R. IT SHOULD SLIP IN EASILY; DO NOT FORCE IT. TURN 'ON'.
 - THE EXTERNAL BATTERY CONNECTS THE SAME WAY.....
 (IT IS NOT RECOMMENDED TO PLUG IN THE AC ADAPTER WHEN RUNNING THE PORTAPACK ON ITS INTERNAL BATTERY.)

Ⓑ R.F. UNIT & ADAPTER - CHECK AT THE BACK OF THE PORTAPACK TO SEE IF THE R.F. UNIT IS INSIDE. (IF YOU CANNOT SEE THE MINI-PLUG SOCKET, IT MAY HAVE SLIPPED ASIDE TO THE INTERNAL BATTERY'S SPACE. SO, OPEN THE DOOR UNDERNEATH THE DECK AND PUSH THE UNIT BACK INTO PLACE).
 - IF USING A T.V./MONITOR SWITCH FROM 'ROD ANTENNA' TO 'EXTERNAL ANTENNA'.
 - CONNECT WIRES FROM THE R.F. UNIT TO THE V.H.F. SCREWS AT THE BACK OF THE T.V. SET (NOT U.H.F.).
 - BE SURE THE R.F. UNIT IS SWITCHED TO 'V.T.R.', NOT 'ANT'.
 - IF USING T.V./MONITOR, SWITCH ON ITS SIDE SHOULD BE ON 'T.V.', NOT 'V.T.R.'.
 - SWITCH T.V. TO THE PROPER CHANNEL (USUALLY 3 OR 4). WHEN YOU BEGIN PLAYBACK, ADJUST THE 'FINE-TUNING' FOR BEST RECEPTION OF PICTURE AND SOUND.

OR Ⓒ 8 ↔ 10 PIN CABLE - FITS ON ONE WAY ONLY. THERE ARE 6 PINS, A GAP, THEN 2 PINS. MAKE SURE YOU ARE HOLDING IT THE RIGHT WAY AROUND TO FIT THE RECEPTACLE ON THE T.V./MONITOR. IT SHOULD FIT IN FAIRLY EASILY; MAKE SURE IT'S SECURELY IN. [TO REMOVE - PINCH THE SPRING-RELEASE BUTTONS ON EITHER SIDE, AND PULL OFF.]
 - THIS SWITCH SHOULD BE ON 'T.V.', NOT 'CAMERA'.
 - SWITCH ON THE SIDE OF MONITOR SHOULD BE ON 'V.T.R.', NOT 'T.V.'
 IT DOES NOT MATTER WHICH CHANNEL THE T.V./MONITOR IS ON.
 - PLUG 10-PIN CABLE INTO SIDE OF PORTAPACK. IT FITS IN SECURELY. SCREW ON SAFETY RING.

- Ⓒ PLAYBACK** -
- 1- TURN ON THE T.V./MONITOR. (ON MANY SETS PULL THE VOLUME KNOB TO TURN ON)
 - 2- THREAD THE TAPE. (INSTRUCTIONS ARE INSIDE THE PORTAPACK LID. FOLLOW CAREFULLY.)
 - 3- FLIP PORTAPACK SWITCH TO 'FORWARD' POSITION. (IF YOU GO TO 'FAST-FORWARD', DO NOT RETURN TO 'FORWARD'; FLIP DIRECTLY TO 'STOP', WAIT A FEW SECONDS, THEN GO TO 'FORWARD'. ALSO, PAUSE IN 'STOP' BETWEEN 'FORWARD' AND 'REWIND'.) ADJUST VOLUME, CONTRAST+BRIGHTNESS.
 - 4- WHEN FINISHED (TURN VOLUME DOWN IF USING R.F.), REWIND TO BEGINNING. FLIP TO 'STOP'.

TO SHOW 1/2" VIDEOTAPES ON TABLE-MODEL V.T.R.'S, YOU WILL NEED:

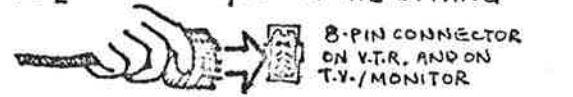
T.V. SET (BE SURE TO CHECK SMALL DOOR AT BACK OF V.T.R. TO ENSURE THAT AN R.F. UNIT IS INSIDE)..... } OR
OR VIDEO MONITOR (WITH SPEAKER)----- } OR

PLAYBACK DECK (CAN BE USED FOR ANY SIZE OF 1/2" REELS)..... } OR
- WITH - POWER CORD (+ ADAPTER)..... } OR
- EMPTY REEL (1 HOUR?)..... } OR
- 8 ↔ 8 PIN CABLE, OR..... } OR
- VIDEO + SOUND CABLES (MONITOR ONLY)..... } OR
- OR, R.F. ADAPTER (FOR T.V./MONITOR)..... } OR
IS THERE AN R.F.U. IN THE BACK OF THE V.T.R.?

MAKE A LIST OF BORROWED TAPES..... } OR
IF THE BORROWER KNOWS HOW TO USE IT, INCLUDE A CLEANING KIT..... } OR

(A) POWER - PLUG IN THE POWER CORD TO THE V.T.R. AND INTO THE WALL. TURN ON THE 'POWER' BUTTON OF THE V.T.R.. PLUG THE MONITOR INTO THE WALL OR BACK OF THE V.T.R., TURN ON.

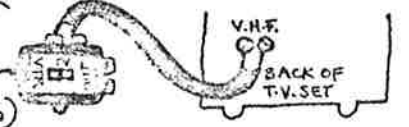
(B) MONITOR - (for TV, see below) CONNECT 8 ↔ 8 PIN CABLE TO THE V.T.R. AND TO THE MONITOR. IT FITS ON ONE WAY ONLY. THERE ARE 6 PINS, A GAP, THEN 2 PINS; BE SURE IT IS RIGHT WAY UP. IT SHOULD FIT IN FAIRLY EASILY - BE SURE IT IS IN SECURELY. [TO REMOVE, PINCH THE SPRING-RELEASE BUTTONS, AND PULL OUT.] SET THE SWITCH ON THE TV/MONITOR TO 'V.T.R.', NOT 'T.V.'



OR MONITOR - CONNECT THE VIDEO CABLE TO THE BACK OF THE V.T.R. AT 'VIDEO OUT', AND TO THE MONITOR AT 'VIDEO IN'... CONNECT THE AUDIO CORD TO THE V.T.R. AT 'LINE OUT', AND TO THE MONITOR AT 'LINE IN'. SET THE SWITCH ON THE T.V./MONITOR TO 'LINE' (OR 'EXT.'), NOT 'T.V.'



OR T.V. - CONNECT THE 'R.F. ADAPTER' TO THE BACK OF THE V.T.R. AT 'R.F. OUT', AND THE TWO WIRES TO THE 'V.H.F.' SCREWS AT THE BACK OF THE TELEVISION SET. (SEE ALSO 'T.V. SET' AT THE TOP OF THIS PAGE.) IF YOU ARE USING A T.V./MONITOR - SWITCH IT TO 'T.V.', NOT 'V.T.R.', AND TO 'EXT. ANTENNA'... BUT BE SURE THE R.F. ADAPTER IS SWITCHED TO 'V.T.R.', NOT 'ANT.' (DOUBLE CHECK; IT'S CONFUSING) TURN THE T.V. TO THE PROPER CHANNEL (USUALLY 3 OR 4). WHEN YOU BEGIN PLAYBACK, ADJUST THE 'FINE-TUNING' FOR BEST RECEPTION OF PICTURE AND SOUND.



(C) PLAYBACK - BEFORE STARTING, BE SURE THE CONTROL-LEVER OF THE V.T.R. IS IN 'STOP' POSITION (NOT 'REWIND', ETC.). THREAD THE TAPE, CAREFULLY FOLLOWING THE DIAGRAM IN THE LID. HOLD TAPE LIGHTLY BY THE EDGES, TO AVOID GETTING GREASE FROM YOUR FINGERS ON THE 'INSIDE' OF THE TAPE. PRESS THE 'TAPE COUNTER' BUTTON, TO RESET IT TO 0-0-0.

- TURN THE CONTROL LEVER GENTLY TO 'FORWARD' POSITION. IT MAY TAKE A FEW SECONDS FOR THE IMAGE TO APPEAR OR BECOME STABLE ON THE T.V./MONITOR.

FAST-FORWARD - IF YOU WISH TO SKIP AHEAD TO ANOTHER PART OF THE TAPE, TURN THE CONTROL-LEVER TO 'STILL' (OR 'PAUSE') POSITION, WAIT A SECOND, THEN MOVE IT INTO 'FAST-FORWARD' POSITION. IF YOU WISH TO CHECK HOW FAR AHEAD YOU'VE SKIPPED, GENTLY PUT IT IN 'STILL' (OR 'PAUSE'), WAIT AGAIN A SECOND OR THREE (YOU CAN SEE THE STILL IMAGE ON THE SCREEN), AND THEN INTO 'FORWARD' POSITION, IF YOU WISH.

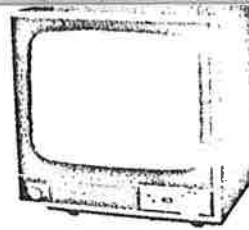
STOP - WHEN THE PLAYBACK HAS ENDED, TURN THE CONTROL-LEVER TO 'STOP'. WAIT A FEW SECONDS, THEN


REWIND - GENTLY MOVE THE CONTROL-LEVER INTO 'REWIND' POSITION. (SOME V.T.R.'S 'SNAP' THE TAPE IF YOU DO IT TOO QUICKLY.) WHEN THE TAPE HAS COMPLETELY REWOUND, A SMALL TAPE-SENSING ARM WILL AUTOMATICALLY SHUT OFF THE POWER OF THE V.T.R. AND THE REEL WILL STOP SPINNING. NONTHELESS, TURN THE CONTROL-LEVER TO 'STOP' (AND THE POWER WILL COME BACK ON). REMOVE THE TAPE, REPLACE ITS 'CLIP' & PUT IT IN ITS BAG AND BOX.

- IF YOU WISH TO VIEW THE SAME TAPE RIGHT AWAY, WHEN REWINDING, STOP BEFORE THE TAPE-COUNTER REACHES 0-0-0. THAT WAY, IT WON'T COME UNTHREADED.

FINISHED? BE SURE THE CONTROL-LEVER IS IN 'STOP' POSITION'. TURN THE POWER OFF, AND PUT THE LID BACK ON, COVER AND CLIP CLOSED. RETURN EVERYTHING YOU BORROWED IN THE SAME ORDER YOU GOT IT IN. REPORT ANY PROBLEMS YOU HAD.

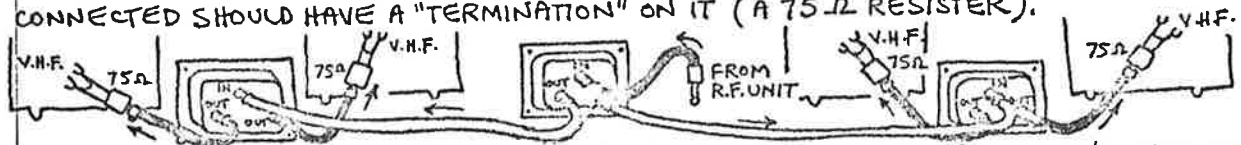
PLAYBACK



8-3 R.F. DISTRIBUTION (continued from the previous page) - I KNOW OF TWO METHODS, WHICH I WILL CALL THE 'SPLITTER METHOD' AND THE 'DOUBLE-TRANSFORMER METHOD'. BOTH USE CO-AXIAL (OR 'CO-AX') CABLE WITH "F" ENDINGS , AND $75 \Omega \rightarrow 300 \Omega$ (OHM) TRANSFORMERS WHICH SCREW ON. THESE ARE COMMONLY AVAILABLE AT ELECTRONICS SUPPLIERS AND MANY T.V. REPAIR SHOPS. THE SPLITTER METHOD, GENERALLY USED FOR PERMANENT EMPLACEMENTS, REQUIRES "SPLITTERS" AS WELL.

8-4 ORDINARY T.V. ANTENNA WIRE (TWIN-LEAD, 300Ω) IS NOT AS GOOD AS 'SHIELDED' CO-AX. ANY OUTSIDE SIGNAL CAN INTERFERE WITH TWIN-LEAD, SO IT USEFUL ONLY OVER VERY SHORT DISTANCES (LIKE INCHES). THE INNER, "LIVE" CORE WIRE IN CO-AXIAL CABLE IS SURROUNDED BY AN OUTER MESH OF COPPER WHICH IS A VERY EFFECTIVE SCREEN AGAINST INTERFERING OUTSIDE SIGNALS.

8-5 SPLITTER METHOD - RUN A MINI \leftrightarrow "F" CO-AXIAL CORD TO THE FIRST SPLITTER, WHICH MAY HAVE TWO OR FOUR "TAPS" OFF IT. USING "F" \leftrightarrow "F" CABLES, CONNECT THE OUTPUTS OF THESE TO THE INPUTS OF THE NEXT SPLITTERS. USING "F" \leftrightarrow "F" CABLES, CONNECT THE OUTPUTS OF THE LAST SPLITTERS TO THE TRANSFORMERS, THE END WIRES OF WHICH SCREW ONTO THE V.H.F. SCREWS OF THE T.V.'S. ANY SPLITTER OUTPUT TO WHICH NO T.V. IS CONNECTED SHOULD HAVE A "TERMINATION" ON IT (A 75Ω RESISTOR).



8-6 THE DOUBLE-TRANSFORMER METHOD - WORKS FINE IF THE T.V.'S ARE CLOSE TOGETHER. RUN A MINI \rightarrow "F" WITH TRANSFORMER, FROM 'R.F.-OUT' ON THE V.T.R. TO THE V.H.F. ANTENNA SCREWS OF A T.V. IN THE CENTRE OF THE OTHERS. PUT $75 \Omega \rightarrow 300 \Omega$ TRANSFORMERS ON THE OTHER CABLES, ONE ON EACH END OF THE CABLE. BRANCHING EQUALLY IN BOTH DIRECTIONS, CONNECT ALL THE T.V.'S TO THE FIRST ONE YOU HOOKED UP.



9 VIDEO DISTRIBUTION - MOST VIDEO MONITORS HAVE AT LEAST TWO VIDEO CONNECTORS, "VIDEO IN", FROM A V.T.R. OR CAMERA SETUP, AND "VIDEO OUT", TO HOOK UP ANOTHER MONITOR OR V.T.R.. YOU CAN CONNECT A WHOLE SERIES OF MONITORS TOGETHER AS LONG AS THE LAST MONITOR IN THE LINE IS 'TERMINATED'. IF THE MONITORS HAVE 75Ω SWITCHES ON THEM, ONLY THE LAST ONE SHOULD BE SWITCHED 'ON'.

10 TERMINATION - IN ORDER FOR A DISTRIBUTION SYSTEM TO WORK EFFECTIVELY, ~~ALL~~ T.V./MONITORS SHOULD BE CONNECTED TO ALL THE "TAPS". IF ONE IS NOT "LOADED", IT UNBALANCES THE SYSTEM AND MAY CAUSE INTERNAL INTERFERENCE TO THE SIGNAL. IT IS ADVISABLE TO CONNECT A 75Ω RESISTOR ACROSS ANY UNUSED OUTPUT IN A DISTRIBUTION SYSTEM, TO DRAIN EXACTLY THE SAME AMOUNT OF CURRENT AS A T.V./MONITOR. YOU MAY PURCHASE "U.H.F." (VIDEO) AND "F" TERMINATORS, BUT YOU CAN SOLDER IN A $\frac{1}{4}W, 75 \Omega$ RESISTOR TO AN UNUSED ENDING YOURSELF. ON MONITORS WITH A 75Ω SWITCH, FLICK IT "ON" IF "VIDEO OUT" ARE THE MONITOR IS NOT BEING USED.

11-1 VIDEO PROJECTION - ONE OF THE ESSENTIAL DIFFERENCES OF VIDEO FROM FILM IS THE FACT THAT IT CAN BE PLAYED ON MANY TV./MONITORS AT THE SAME TIME. STRAY LIGHT IN THE ROOM WILL NOT AFFECT THE IMAGE VERY MUCH. HOWEVER, THERE ARE SEVERAL WAYS OF PROJECTING VIDEO ONTO A LARGER, REFLECTIVE SCREEN; USEFUL IN SOME, BUT NOT ALL PLAYBACK SITUATIONS.

11-2 "BEAM" OR "CANNON" PROJECTORS USE CURVED MIRRORS TO REFLECT THE SCAN ONTO FILM SCREENS UP TO 8' X 10'. THEIR CONTRAST IS RATHER LOW; AND THEY ARE NOT ALWAYS STABLE PREFERRED EVEN-VIDEO LEVELS FROM WELL-LIT RECORDINGS. IF IT HAS MANUAL GAIN, YOU MAY HAVE TO SIT WITH A SMALL SCREWDRIVER TO ADJUST IT, WHEN PLAYING "HOME-MADE" OR EXPERIMENTAL TAPE. ADVENT MANUFACTURES A 3-BEAM COLOUR PROJECTOR, WHICH IS INEXPENSIVE AND BRIGHT ON ITS "DAYLIGHT" SCREEN. IT TAKES ABOUT $\frac{1}{2}$ HOUR TO ADJUST THE BEAMS, WHICH TEND TO GO OUT OF ALIGNMENT.

11-3 SONY SELLS A PROJECTOR WHICH CONSISTS ESSENTIALLY OF A TRINTRON MONITOR IN AN OVER-HEAD PROJECTOR. IT ALSO USES A SLIGHTLY CURVED "DAYLIGHT" SCREEN. THIS CONTAINS MANY TINY PRISMS, AND SIMILAR TO REAR REFLECTORS ON AUTOMOBILES AND BICYCLES, THEY SEND LIGHT BACK TO THE SOURCE, SCATTERING ONLY ABOUT 15° . YOU MUST SIT DIRECTLY IN FRONT OF THE SCREEN FOR MAXIMUM CLARITY. IF YOU ARE NEXT TO THE SCREEN BUT OFF TO THE SIDE, YOU WON'T SEE AN IMAGE; BUT IT IS VERY CLEAR FROM THE BACK OF THE ROOM. SIDE LIGHTING, SUCH AS WINDOWS AT THE FRONT, WILL NOT 'WASH-OUT' THE SCREEN.

11-4 PHILIPS' "EIDOPHOR" PROJECTOR IS EXTREMELY BRIGHT, CLEAR & STABLE. USING A REMAGNIFICATION PROCESS, IT PROJECTS UP TO 30' X 40'. BTW PROJECTOR RENTAL IS \sim \$1500 A DAY; COLOUR... ?

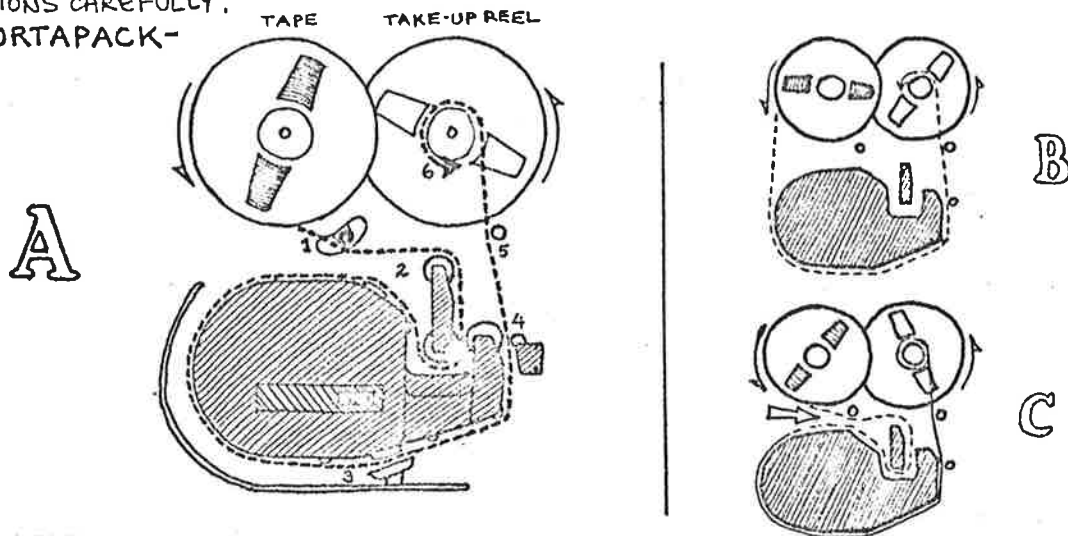
THREADING, HEAD-CLEANING

(3)

1-1 THREADING DIAGRAMS ARE FOUND IN THE LIDS OF MOST V.T.R.'S. FOLLOW THE INSTRUCTIONS CAREFULLY.

1-2

PORTAPACK-



1-3

THE EMPTY 'TAKE-UP' REEL SHOULD BE ON THE RIGHT-HAND SIDE. PLACE THE TAPE REEL ON THE LEFT, AND UNWIND ABOUT 2 1/2' OF TAPE. ONLY THE INSIDE, SHINY SIDE OF THE VIDEOTAPE SHOULD TOUCH THE RECORDING HEADS. HANDLE THE TAPE LIGHTLY BY THE EDGES, TO AVOID GETTING NATURAL GREASE FROM YOUR FINGERS ONTO THE INSIDE OF THE TAPE; DON'T LET THE TAPE LIE ON A DUSTY TABLE.

1-4

FOLLOWING DIAGRAM A - THREAD OUTSIDE PIN #1. GO AROUND THE ROLLER (#2) AND BACK THEN AROUND THE 'HEAD-DRUM'. IT DROPS INTO A SLOT (#3), THEN UP INSIDE THE CAPSTAN-PIN (#4) AND INSIDE PIN #5. HOLD THE END OF THE TAPE AGAINST WITH RUBBER CORE OF THE TAKE-UP REEL WITH YOUR FINGER-TIP; TURN THE TAKE UP REEL, STILL HOLDING THE TAPE IN, UNTIL IT CATCHES ON ITSELF (#6).
- BE SURE TO THREAD OUTSIDE PIN #1 AND INSIDE PINS #4 AND 5.

1-5

QUICK THREADING METHOD - AS IN DIAGRAM B, THREAD THE TAPE RIGHT AROUND THE HEAD-DRUM, INSIDE PINS 4 AND 5, AND AROUND THE EMPTY-REEL. WITH THE INDEX FINGER OF YOUR RIGHT HAND MOVE THE TAPE IN THE DIRECTION OF THE ARROW, SLACKENING THE TAPE BY TURNING THE TAKE-UP REEL WITH YOUR LEFT HAND (DIAGRAM C). SLIP IT OVER THE CENTRE BAR, THEN GENTLY TIGHTEN THE TAPE BY TURNING ONE OF THE REELS.

THIS METHOD IS EASY AND SWIFT. HOWEVER, I LEARNED METHOD A FIRST, AND HAVE STUCK WITH IT.

1-6

MISTAKES - IF PERCHANCE THE TAPE WAS THREADED WRONGLY (eg. - OUTSIDE, INSTEAD OF INSIDE A PIN), YOU MAY FIND THAT IT WILL NOT PLAY BACK PROPERLY WHEN THREADED CORRECTLY. TRY REPEATING THE MISTAKE YOU MADE WHEN YOU RECORDED; IT MAY PLAY BACK ALL RIGHT.

- LARGER DECKS ARE EVEN EASIER TO THREAD, BUT A COMMON MISTAKE

IS TO THREAD INSIDE THE BENT PIN ON THE RIGHT SIDE OF THE HEAD-DRUM.

- ON OLD STANDARD (eg. SONY CV SERIES) DECKS, TAPE WAS THREADED INSIDE

PIN #1.

CLEANING

2-1

DUST, GREASE, ASHES AND OTHER DEBRIS SHOULD BE PREVENTED FROM BUILDING UP ON THE VIDEO AND AUDIO HEADS, SINCE THEY PREVENT THEIR MAGNETIC FIELDS FROM BEING PROPERLY TRANSFERRED TO THE TAPE. V.T.R. MANUFACTURERS SUGGEST THAT EQUIPMENT AND TAPE BE USED AND STORED IN A DUST-FREE ENVIRONMENT (MAYBE THAT'S WHY MEDICAL VIDEO IS SUCH A BIG THING); HOWEVER, ALMOST EVERYONE I KNOW WORKS IN DUSTY PLACES ... SO IT IS ESPECIALLY IMPORTANT TO CLEAN HEADS OFTEN.

2-2

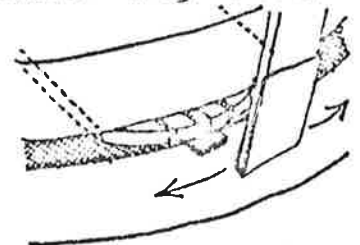
THE MOST COMMON METHOD OF HEAD-CLEANING USES ALCOHOL AND CHAMOIS (PRONOUNCED - "SHAMMY" IN ENGLISH; "SHAM-WA" IN FRENCH. IT'S DEER-SKIN.) STICKS. USE ONLY VERY PURE ALCOHOL OR THE IMPURITIES WILL BUILD UP A SEDIMENT ON THE HEADS. ETHANOL (ETHYL ALCOHOL) OR METHANOL (METHYL ALCOHOL) CAN BE READILY PURCHASED IN MOST PHARMACIES.

2-3

THE VIDEO HEADS SPIN AROUND ON EITHER SIDE OF THE SLOT ON THE 'HEAD-DRUM' ASSEMBLY. NEVER CLEAN OR TOUCH VIDEO HEADS WHILE THEY ARE SPINNING; THEY ARE FRAGILE AND CRACK EASILY. THE VIDEO-HEAD IS A TINY, FLAT NEEDLE, USUALLY BLACK, ON A GOLDEN-COLOURED PROTRUSION.

2-5


PIP THE CHAMOIS-STICK TO GET IT MOIST AND SOFT (NOT DRIPPING WET), GENTLY PLACE IT AGAINST THE VIDEO HEAD, AND CLEAN BY MOVING FROM SIDE-TO-SIDE, NEVER UP AND DOWN. THE OTHER HEAD WILL BE

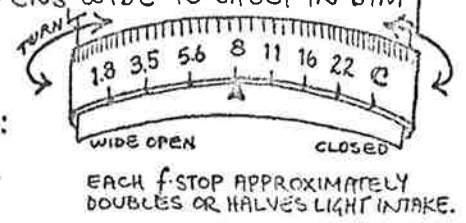


2-4
EXT
PAGE

VISION

(3-7) CLOSE TO AN OBJECT. THEY ARE SCREWED BETWEEN THE LENS AND CAMERA, FURTHER SEPARATING THE LENS FROM THE CAMERA-TUBE. THERE ARE NO LENSES INVOLVED; THEY ARE MERELY HOLLOW MATTE-BLACK TUBES... YOU MIGHT BE ABLE TO IMPROVISE ONE IN A PINCH. THESE TUBES, AND CLOSE-UP ADAPTERS WHICH SCREW ON TO THE FRONT OF THE LENS (see AUXILIARY EQUIPMENT SECTION) COME IN HANDY FOR TITLES, COPYING PARTS OF PHOTOGRAPHS (MOVE THE PAPER, NOT THE CAMERA), SHOOTING INSECTS, ETC. YOU CAN 'CHEAT' AND MOVE A BIT CLOSER THAN NORMAL WITHOUT EXTENDERS BY UNSCREWING YOUR LENS A BIT... BUT BE CAREFUL THAT IT DOESN'T FALL OUT. FOR THESE METHODS THE CAMERA MUST BE QUITE STEADY, SINCE THE SLIGHTEST MOVEMENT IN OR OUT WILL PUT THE OBJECT OUT OF FOCUS. EXTRA LIGHTING MAY BE REQUIRED.

4-1  **f-STOPS** (PRONOUNCED AS AN "F") ARE THE SETTINGS OF THE LENS DIAPHRAGM. LIKE THE IRIS OF THE HUMAN EYE, IT LETS IN MORE LIGHT WHEN WIDE OPEN THAN WHEN THE OPENING IS SMALL. IT'S A BIT CONFUSING, SO PLEASE REMEMBER THAT - THE HIGHER THE **f**-STOP NUMBER, THE MORE THE LENS IS CLOSED (STOPPED "DOWN"); THE LOWER THE **f**-STOP NUMBER, THE MORE THE LENS IS OPEN. MORE LIGHT GETS IN AT LOWER **f**-STOPS. ONE QUALITY TO LOOK FOR IN A LENS IS WHAT ITS LOWEST **f**-STOP NUMBER IS, BECAUSE YOU NEED A LENS THAT OPENS WIDE TO SHOOT IN DIM LIGHTING. TO MAINTAIN EVEN LIGHTING THROUGHOUT YOUR TAPING, YOU SHOULD OPEN THE LENS IN DIM LIGHT, AND STOP IT DOWN IN BRIGHT LIGHT.

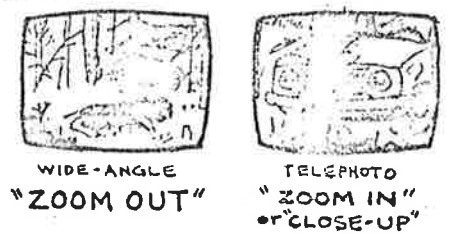


4-2 THE FOLLOWING AVERAGE HAS BEEN SUGGESTED FOR VIDEO:
 INDOORS (NORMAL ARTIFICIAL LIGHTING) - **f/1.8**
 OUTDOORS, CLOUDY OR SHADE - **f/3.5** TO **f/5.6**
 OUTDOORS, BRIGHT SCENES - **f/8** TO **f/11**.

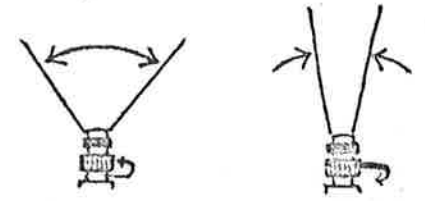
4-3 WHEN THE LENS IS STOPPED DOWN YOU WILL FIND IT EASIER TO FOCUS ON YOUR SUBJECT; IN FACT, MORE OF THE SUBJECT WILL BE IN FOCUS. THIS PHENOMENON IS KNOWN AS "DEPTH OF FIELD", AND IS COMMON TO ALL LENSES. WHEN THE LENS IS WIDE OPEN, ONLY THE SUBJECT IS IN FOCUS; IF YOUR SUBJECT IS CLOSE UP, ONLY PART OF IT MAY BE SHARPLY IN FOCUS. AS YOU STOP DOWN, OBJECTS IN FRONT AND BEHIND THE SUBJECT COME INTO FOCUS, AS THE DEPTH-OF-FIELD INCREASES. SQUINTING AT THINGS THROUGH YOUR EYELIDS CAN HAVE THE SAME EFFECT.

4-4 IF YOU CAN CONTROL THE LIGHTING, OR SENSITIVITY OF YOUR CAMERA, YOU MAY BE ABLE TO USE THE ABOVE INFORMATION. IF PEOPLE ARE SITTING IN A STRAIGHT LINE, FOR EXAMPLE, AND YOU ARE SHOOTING 'DOWN' THE ROW, YOU CAN CHOOSE TO HAVE ONLY ONE FACE IN FOCUS AT A TIME (OPEN WIDE), OR AS MANY PEOPLE IN FOCUS AS POSSIBLE (STOP DOWN). IT'S UP TO YOU. SOME LENSES HAVE DEPTH-OF-FIELD SCALES MARKED ON THEM.

5-1 **ZOOM LENSES** USE A COMPLEX SET OF MOVING PARTS TO VARY THEIR ANGLE OF VISION. OFTEN AS YOU CHANGE THE ANGLE YOU WILL HAVE TO RE-ADJUST THE FOCUS, SO I SUGGEST YOU TRY TO TURN THE TELEPHOTO RING WITH YOUR THUMB AND FORE-FINGER, AND USE YOUR THIRD FINGER TO ADJUST THE FOCUS RING (see ILLUSTRATION ON PREVIOUS PAGE), SIMULTANEOUSLY IF POSSIBLE, OR QUICKLY AFTER ZOOMING.



5-2 IF YOUR SUBJECT IS NOT MOVING, IT WILL STAY IN FOCUS AT ANY ANGLE OF ZOOM IF YOU FIRST ZOOM IN AND FOCUS, THEN 'PULL OUT'. IF YOU FOCUS FIRST IN WIDE-ANGLE, THEN ZOOM IN, YOU'LL SOON FIND YOUR SUBJECT IS OUT OF FOCUS. TO GET THE SHARPEST FOCUS, DO IT AT FULL TELEPHOTO WITH THE LENS OPEN WIDE (IF LIGHT PERMITS), BECAUSE THAT'S WHERE YOU'LL GET THE LEAST DEPTH OF FIELD.



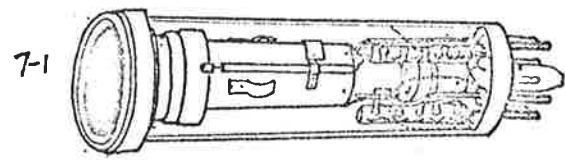
5-3 ALL ZOOM LENSES COME IN RATIOS (eg. 4:1, 7:1, 10:1), INDICATING THE RANGE OF ANGLES IT CAN MOVE THROUGH. THE MORE THE BETTER, IF IT ZOOMS SMOOTHLY AND STAYS IN FOCUS THROUGHOUT THE IMAGE AND AT ALL ANGLES.

5-4 TELEPHOTO LENSES HAVE QUITE NARROW VIEWING ANGLES (100mm. - °; 500mm. - °), AND MUST BE HELD QUITE STEADY ON A SOLID TRIPOD. THE SLIGHTEST MOVEMENT OF THE LENS WILL SHIFT THE IMAGE FAR TO THE SIDE OF YOUR SUBJECT; AND ANY TREMOR IN HOLDING THE LENS WILL SHOW UP AS A CLEAR EARTHQUAKE, WITH YOUR SUBJECT A BLUR.

5-5 **WIDE-ANGLE LENSES** ARE EXCELLENT FOR RECORDING PEOPLE UP CLOSE; YOU CAN EVEN BE PART OF THE CONVERSATION. IF YOU ARE TOO CLOSE THOUGH, YOUR SUBJECT MAY DISTORT IN A MILD "FISH-EYE" EFFECT. SOME HAVE VERY LOW **f**-STOPS, FINE FOR DIM LIGHTING.

VISION

6-1 ALL LENSES HAVE MOVING PARTS, AND THEY ARE DIFFICULT TO REPAIR. TAKE CARE NOT TO DROP THEM OR JAR THEM, AND KEEP THEM AWAY FROM SAND AND EXCESSIVE TEMPERATURE. STORE LENSES IN THE CASE THEY COME IN. WHEN SHIPPING THE PORTAPACK YOU MIGHT DO WELL TO REMOVE THE LENS FROM THE CAMERA, COVER BOTH ENDS OF THE LENS AND THE CAMERA WITH CAPS PROVIDED, AND PACK THEM SEPARATELY. KEEP THE FRONT (AND BACK) EXPOSED GLASS CLEAN, AS ANY SPOTS ON THEM WILL SHOW UP ON YOUR RECORDING (IN FACT, WHAT APPEAR TO BE PERSISTANT BURNS MAY ONLY BE A DIRTY LENS).



7-1 THE STANDARD PORTAPACK CAMERA TUBE IS A 2/3" DIAMETER VIDICON TUBE. IT IS RELATIVELY INEXPENSIVE (~\$80), BUT MAY HAVE TO BE REPLACED FROM TIME TO TIME (see REPAIR section).

7-2 ALTHOUGH I'VE NEVER HAD THE PROBLEM, I WILL PASS ALONG THE MANUFACTURER'S SUGGESTION THAT YOU NOT SHAKE THE CAMERA WHILE IT IS POINTED DOWN. DEBRIS FROM INSIDE THE TUBE COULD SIFT DOWN AND STICK ONTO THE FACE OF THE TUBE, RESULTING IN 'TARGET SPOTS' WHICH CANNOT BE REMOVED. I'M TOLD TUBE MANUFACTURE HAS BEEN IMPROVED.

7-3 YOU SHOULD NOT LEAVE THE LENS OFF THE CAMERA WITHOUT COVERING THE HOLE OVER THE TUBE, BECAUSE A BRIGHT STRAY LIGHT COULD HARM THE VIDICON AND PARTICLES OF DIRT MAY GET IN. IF THE FRONT GLASS PLATE OF YOUR TUBE HAS DUST PARTICLES ON IT, YOU CAN USE ALCOHOL AND A Q-TIP (MOISTENED, NOT DRIPPING WET) TO CLEAN IT OFF. DO NOT TOUCH THE FRONT (FACE-PLATE) OF THE TUBE WITH YOUR FINGERS.

8-1 BURNS. IN THE DARK, WHERE WE SEE IN BLACK AND WHITE, OUR EYES AVIDLY SEARCH OUT LIGHT. PHOTONEURONS (LIGHT-SENSITIVE NERVES) CAN TIRE IF "EXCITED" BY LIGHT RAYS ON THE SAME SPOT, SO THE EYE PRODUCES A SUBSTANCE CALLED 'VISUAL PURPLE' WHICH RELAXES CELLS AFTER THEY ARE STIMULATED FOR A WHILE. CLOSE YOUR EYES, AND ANY BRIGHT LIGHTS IN THE ENVIRONMENT WILL REMAIN ON AS 'AFTER-IMAGES'; SUDDEN BRIGHT FLASHES IN THE DARK WILL LEAVE "SPOTS IN FRONT OF YOUR EYES". THE VIDICON TUBE WORKS IN A SOMEWHAT SIMILAR WAY, EXCEPT IT IS NOT AS EFFECIENT AT REPLENISHING ITSELF.

8-2 CHANGING LIGHT PATTERNS ON THE 'TARGET' OF THE TUBE ARE ANALYSED, AND FADE AWAY. THE BRIGHTER A SPOT IN CONTRAST TO THE REST OF THE IMAGE, THE LONGER IT TAKES TO FADE. IF IT IS TOO BRIGHT, IT 'STICKS', LEAVING A GREY MARK ON THE TUBE, SOMETIMES FOREVER. THESE SPOTS "SMUDGES" AND TRACED LINES ARE KNOWN AS 'BURNS'. YOU MUST TAKE CARE TO AVOID POINTING THE CAMERA AT BRIGHT LIGHTS. THE SUN IS AN OBVIOUS NO-NO SO ARE SPOT-LIGHTS. BECAUSE THE AUTOMATIC GAIN CONTROL IS ALWAYS STRIVING TO MAINTAIN AN OPTIMUM OVERALL LIGHT LEVEL, IT INTENSIFIES LIGHT IN DIM ENVIRONMENTS. A CANDLE IN A DARK ROOM CAN BURN THE TUBE. WATCH OUT TOO FOR REFLECTIONS WHICH ARE BRIGHT - THE SUN ON WATER, MIRRORS, GLASS OR SHINY METALS.

8-3 MODERATELY BRIGHT LIGHTS WILL 'STICK' A LITTLE, LEAVING A TRAIL BEHIND THEM AS THEY MOVE ACROSS THE IMAGE. AS LONG AS THEY ARE "RESORBED" IN A COUPLE OF SECONDS, YOU NEEDN'T WORRY ABOUT THEM. IF THEY ARE VERY STICKY, STOP DOWN THE LENS, OR POINT THE CAMERA SOMEWHERE ELSE.

8-4 SOME PERSISTANT BURNS WILL SLOWLY DISAPPEAR, ALTHOUGH THEY WILL SHOW IN SUBSEQUENT TAPING UNTIL THEY ARE GONE. THERE IS A METHOD TO ENCOURAGE THEM TO SOFTEN AND "RESORB", KNOWN AS 'BURNING OUT' (see MAINTENANCE section); BUT IT WILL NOT WORK ON DARK BURNS. BURNING OUT ALSO CUTS BACK ON THE CONTRAST-RANGE OF THE TUBE. IF YOU INADVERTANTLY BURN SOMEONE'S BORROWED CAMERA (IT EVENTUALLY HAPPENS TO EVERYONE) YOU SHOULD TELL THEM SO. THEY'LL FIND OUT NEXT TIME THEY SHOOT ANYWAYS - A REAL IRRITATION IF YOU'RE ABOUT TO RECORD.

8-5 OLD VIDICON TUBES BURN FROM MANY HOURS OF USE, FAIRLY EVENLY ACROSS THE ENTIRE FACE-PLATE. EVENTUALLY IT LOOKS LIKE YOU ARE SHOOTING THROUGH A SCREEN, AND THE TUBE SHOULD BE REPLACED. BURNS SHOW MORE CLEARLY WHEN THE LENS IS CLOSED.

8-6 MORE EXPENSIVE TUBES DO NOT BURN AS EASILY. eg-IMAGE ORTHICON, PLUMBICON, SILICON DIODE etc.

9-1 GHOSTING OCCURS IN DIM LIGHTING. IF, FOR EXAMPLE, SOMEONE RUNS IN FRONT OF THE CAMERA, THERE MAY NOT BE ENOUGH LIGHT FOR THEIR IMAGE TO STICK AT ALL, AND THE PREVIOUS IMAGE WILL SHOW RIGHT THROUGH THEM. THEY WILL APPEAR TO BE TRANSPARENT.

VISION

10-1 SILICON DIODE CAMERA TUBES ARE ALSO MANUFACTURED FOR SMALL-FORMAT VIDEO, COSTING UPWARDS OF \$800. TEXAS INSTRUMENTS LTD. DEVELOPED THIS TUBE (SHADES OF VIETNAM) AND MARKETED IT UNDER THEIR BRAND NAME "TIVICON". THEY HAVE SINCE STOPPED PRODUCTION OF ALL VACUUM-TUBES, AND ALMOST PRETEND THEY NEVER DID. THEIR SERVICE LEAVES MUCH TO BE DESIRED. I'M TOLD THAT DUE TO A DIFFICULT MANUFACTURING PROCESS ONLY ABOUT 1 OUT OF 10 LENSES IS PERFECT. MOST SILICON DIODE TUBES HAVE PINPOINT DROPOUTS OR BLEMISHES, OFTEN IN THE VISIBLE PART OF THE IMAGE. DISTRIBUTORS PROVIDE A CHART OF THE TARGET WHICH SHOW WHERE THESE ARE.

10-2 SILICON DIODE TUBES WORK WELL WITH MOST LIGHT SOURCES, BUT ARE ESPECIALLY SENSITIVE TO INFRA-RED LIGHT, AND ONLY THOSE SOURCES CONTAINING INFRA-RED CAN FULLY UTILIZE THEIR WIDE SPECTRAL BANDWIDTH. INCANDESCENT LIGHTS IN PARTICULAR ALLOW THE TUBE TO SEE IN LIGHT LEVELS WHICH APPEAR LOW TO THE EYE. CANDLES ARE GREAT! XENON-ARC LAMPS ARE ALSO A GOOD SPECTRAL MATCH. MERCURY-VAPOUR LAMPS AND FLUORESCENT LIGHTS ARE QUITE BLUE IN COMPARISON, AND ARE NOT WELL MATCHED TO THE SILICON-DIODE. RED FLOODLIGHTS SHOW UP FINE, BUT ELIMINATE SHADOWS FROM FLESH TONES, SO FACES LOOK FLAT, PLASTIC. FOR OPERATION IN THE DARK, EITHER FILTERED INCANDESCENT, XENON LAMPS, OR GALLIUM-ARSENIDE LIGHT-EMITTING DIODES (SO FAR, ONLY POLICE CAN AFFORD THE LATTER) MAY BE USED TO PROVIDE INFRA-RED ONLY ILLUMINATION. IF THE INFRA-RED LIGHT SOURCE HITS THE FACEPLATE OF THE TUBE DIRECTLY, AS WELL AS BEING REFLECTED OFF THE SUBJECT(S), IMPROPER GREY-SCALE RENDITION WILL RESULT IN SUCH EFFECTS AS THE WHITENING OF FOLIAGE. THE FOLLOWING FILTERS SHOULD BE USED: IN VISIBLE LIGHT - SCHOTT KG-3; INFRA-RED ONLY - CORNING 7-56. USE A NEUTRAL-DENSITY FILTER IN BRIGHT LIGHT

10-3 MOST LENSES WILL WORK WELL WITH THIS TUBE, THOUGH INEXPENSIVE LENSES MAY NOT PRESENT A "CRISP" IMAGE AT THEIR LARGER f-STOPS WHEN WIDEBAND SOURCES OF ILLUMINATION ARE USED. SOMETIMES IT LOOKS FUZZY IN THE VIEWFINDER BUT PLAYS BACK O.K. THERE IS A SLIGHT SHIFT OF FOCUS WHEN THE LIGHT SOURCE IS CHANGED FROM VISIBLE TO INFRA-RED.

10-4 SILICON DIODE TUBES DO NOT 'BURN' EVEN IN THE BRIGHTEST LIGHT. BRIGHT SPOTS DO NOT LEAVE 'TRAILS' AS ON A VIDICON TUBE, BUT A DIFFERENT PHENOMENON OCCURS - THEY TEND TO "BLOB" AROUND BRIGHT SOURCES OF LIGHT. STOPPING DOWN THE LENS ELIMINATES THIS IMMEDIATELY, BUT OF COURSE CUTS DOWN ON THE CONTRAST OF THE SCENE AS WELL. SILICON DIODE TUBES IN ORDINARY LIGHTING ARE AT THEIR BEST IN DIFFUSE, EVEN LIGHTING, SUCH AS INDOORS, OR AT DUSK. THEIR ADVANTAGE IN THESE SITUATIONS IS THEY ADD 2 TO 3 STOPS OF SENSITIVITY, SO ADDED LIGHTING IS NOT NEEDED. *

10-5 IN GENERAL, THEY ARE NOT AS VERSATILE AS VIDICON TUBES, SO I WOULD NOT TIE UP A PORTAPACK FOR LOW-LIGHT USE. WE PUT OURS IN AN OLD CV CAMERA WHICH COST \$200 AND IS COMPLETELY COMPATIBLE WITH THE E.I.A.J. DECKS (SONY FOR SURE - CHECK WITH A TECHNICIAN ABOUT OTHER BRANDS). THEY ALSO OFTEN HAVE 'BLEMISHES' ON THE FACE-PLATE, BEFORE YOU PURCHASE A SILICON-DIODE TUBE, ASK FOR THE MANUFACTURER'S FACE-PLATE DIAGRAM TO FIND THEM.



11-1 NOT MANY GROUPS CAN AFFORD LOW-LIGHT LEVEL TUBES, SO LIGHTING IS OF GREAT IMPORTANCE, FOR A GOOD PLAYBACK IMAGE AND FOR RECORDING STABILITY. THERE ARE SEVERAL MANUALS AVAILABLE WHICH DEAL WITH ARTIFICIAL LIGHTING ADEQUATELY FOR PHOTOGRAPHY, "TELEVISION" PRODUCTION AND FILM-MAKING. ALSO, I PREFER TO WORK WITH AVAILABLE LIGHTING AS MUCH AS POSSIBLE, SO THAT'S THE EXPERIENCE I'LL SHARE WITH YOU... EXCEPT TO MENTION THAT 64 FOOT - CANDLES OVERALL LIGHTING IS IDEAL FOR VIDEO.

11-2 CONTRAST OF THE VIDEO IMAGE DEPENDS ON SEVERAL VARIABLES: THE LENS OPENING, BRIGHTNESS IN DIFFERENT PARTS OF THE SCENE; IN SOME STUDIO CAMERAS IT CAN BE AFFECTED BY TARGET-SENSITIVITY AND BEAM-INTENSITY CONTROLS FOR THE PICTURE-TUBE; AND TO A SMALL EXTENT CONTRAST CAN BE CHANGED WITH THE MANUAL VIDEO GAIN CONTROL OF EDITING DECKS (BUT TOO HIGH GAIN CAUSES THE IMAGE TO FLARE TOO LOW AND THE RECORDING LOSES STABILITY). IN GENERAL, SUNNY SCENES ARE MORE CONTRASTY THAN DIFFUSE INDOOR LIGHTING. WHEN SHOOTING IN A LIGHT SITUATION WITH A VARIETY OF LIGHTING INTENSITIES, YOU MAY WANT TO KEEP A FINGER NEAR THE f-STOP TO ADJUST THE LENS-OPENING FOR AN EVEN RECORDING.

11-3 THE A.G.C. (AUTOMATIC GAIN CONTROL) ALWAYS TRIES TO KEEP THE RECORDING INTENSITY AT AN OPTIMUM LEVEL. BRIGHT SCENES REMAIN QUITE CONTRASTY THOUGH, UNTIL THE LENS IS STOPPED-DOWN. DIM-LIGHTING IS HARDER FOR IT TO DEAL WITH.

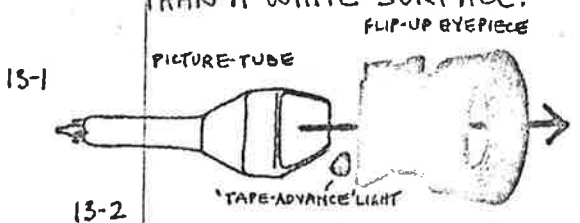
VISION

EVEN A SMALL, SHARP LIGHT ENTERING THE PICTURE WILL CAUSE THE A.G.C. TO COMPENSATE BY DROPPING THE ALREADY POOR CONTRAST OF THE GREY SCENE. FOR EXAMPLE, WHEN RECORDING IN A DIM ROOM, SHOOTING SOMEONE WHO IS NEXT TO A WINDOW FRAME, AS YOU CATCH A BIT OF THE WINDOW IN THE EDGE OF THE VIEWFINDER, THE PERSON YOU'VE BEEN RECORDING WILL SUDDENLY GO GREY. IF THEY ARE RIGHT AGAINST THE WINDOW, YOU WILL GET ONLY THEIR SILHOUETTE (QUITE BEAUTIFUL IF YOU HAVE A PROFILE SHOT, BUT A BOTHER IF THEY ARE FACING THE CAMERA). SOMETIMES WHEN A BRIGHT POINT FIRST ENTERS THE PICTURE FRAME, A DARK, HORIZONTAL BAR OF A FLASH OF BRIGHTNESS WILL SPREAD ACROSS THE ENTIRE IMAGE. IF THIS PHENOMENON OCCURS I MOVE THE LIGHT SOURCE RIGHT INTO FRAME OR RIGHT OUT (THE LATTER IS NECESSARY IF IT IS INTENSE ENOUGH TO BURN THE VIDICON). UNEXPLAINABLY, I HAVE FOUND THAT IN CERTAIN SITUATIONS, WHEN A LIGHT CATCHES THE CORNER OF THE PICTURE FRAME, A PREVIOUSLY DIM SCENE SUDDENLY SEEMS TO IMPROVE IN CONTRAST. WHEN THIS OCCURS I HOLD THE LIGHT AT THE EDGE TO TAKE ADVANTAGE OF THE IMPROVED GAIN.

11-4 MODERATELY BRIGHT, EVENLY-LIT ENVIRONMENTS ARE BEST FOR A WIDE RANGE OF CONTRAST ON VIDEO. SHOOT WITH WINDOWS, LAMPS, ETC. BEHIND YOU SO THAT YOU DON'T SHOOT INTO THEM, UNLESS OF COURSE YOU CHOOSE TO DO SO. NEVER SHOOT DIRECTLY INTO VERY BRIGHT LIGHTS.

12-1 COLOUR RECORDING DEMANDS CAREFUL ATTENTION TO LIGHTING FOR BEST RESULTS. LIGHTS HAVE DIFFERENT COLOUR "TEMPERATURES"; THOUGH THEY APPEAR TO BE WHITE, SOME ARE REDDISH OR YELLOW, OTHERS MORE BLUE (SUCH AS FLUORESCENT LAMPS), EVEN, BALANCED ILLUMINATION AND COLOUR TEMPERATURE GIVE THE LEAST FLUCTUATION OF COLOUR REPRODUCTION (OBJECTS GO BLUE IN DIMMER LIGHT, AND GRAININESS INCREASES).

12-2 COLOUR CAMERAS WHICH USE A VARIABLE SETTING TO BALANCE THE "WHITE" BY AIMING THE CAMERA AT A "NEUTRAL" CARD SHOULD BE DE-FOCUSED DURING THIS PROCESS. IT SHOULD BE POINTED AT A REFLECTED LIGHT. IF USING A CARD TO DO THIS, IT SHOULD REFLECT THE LIGHT EVENLY OVER ITS SURFACE, AND THE CARD SHOULD FILL THE PICTURE FRAME. YOU MAY FIND THAT LIGHT-GRAY OR SLIGHTLY MAJENTA WILL WORK BETTER THAN A WHITE SURFACE.



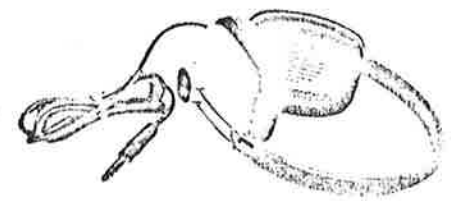
15-1 THE CAMERA-MONITOR IN THE VIEWFINDER CAN BE ADJUSTED ONLY BY TAKING THE COVER RIGHT OFF THE CAMERA (SEE MAINTENANCE SECTION). IT IS SET AT AN AVERAGE BRIGHTNESS AND CONTRAST.

13-2 IN BRIGHT LIGHT THE MINI-MONITOR IS FAR TOO CONTRASTY AND IT GETS HARD TO DECIDE WHICH LENS OPENING IS BEST. IN A VERY BRIGHT ENVIRONMENT OPEN THE LENS UP WIDE THEN SLOWLY CLOSE DOWN THE f-STOP WHILE MOVING THE CAMERA SIDE TO SIDE. WHEN THE LIGHT RETARDATION (SILVERY WHITE BLOB DUE TO OVERLOADED VIDEO GAIN) DISAPPEARS, YOU'RE AT THE RIGHT f-STOP. EVEN THOUGH IT MAY STILL APPEAR TOO CONTRASTY IN THE VIEWFINDER, IT SHOULD PLAY BACK WITH A GOOD CONTRAST RANGE.

13-3 IN DIM-LIGHTING THE PICTURE IN THE CAMERA MONITOR MAY LOOK COMPLETELY WASHED-OUT. OFTEN IT WILL APPEAR MUCH BETTER ON A T.V./MONITOR, WHICH CAN ALSO BE ADJUSTED FOR HIGHER CONTRAST.

14-1 IF YOU FIND THAT THE CAMERA EYEPIECE KEEPS FOGGING OVER (...GOT SWEATY EYES?) MAKING IT HARD TO FOCUS, HOLD IT A BIT AWAY FROM YOUR EYE TO LET COOLER AIR IN, OR FLIP THE EYEPIECE UP AND HOLD THE CAMERA FURTHER AWAY, VIEWING THE MINI-MONITOR WITH BOTH EYES. IN SOME INSTANCES YOU MAY PREFER TO WATCH A LARGE T.V./MONITOR WHILE YOU ARE SHOOTING (CONNECT IT TO THE PORTAPACK VIA R.F.). THAT WAY YOU NEEDN'T KEEP THE CAMERA NEXT TO YOUR EYE (eg- FOR CLOSEUPS, IN HARD TO REACH PLACES, ABOVE YOUR HEAD, ETC.). THE EYEPIECE HAS A HABIT OF BREAKING OFF IF MISHANDLED, SO TAKE CARE NOT TO KNOCK IT AGAINST THINGS. YOU NEED THE LENS IN IT TO VIEW THE MINI-MONITOR THROUGH ONE EYE, AND IT STEADIES THE CAMERA TO HOLD IT AGAINST THE BRIDGE OF YOUR NOSE.

15 TAKING PHOTOS OF VIDEOTAPES: USE A TWIN-LENS REFLEX CAMERA AT 1/30 SEC., 35MM. CAMERAS HAVE A FOCAL-PLANE SHUTTER, WHICH MOVES HORIZONTALLY ACROSS THE IMAGE, WHILE T.V. SCANS ACROSS AND DOWN. AN OBLIQUE LINE ACROSS THE PHOTO OF THE TV RESULTS. SO USE A 2 1/4" SLR CAMERA FOR CLEAR PHOTOGRAPHS



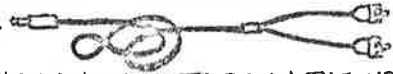
SOUND

1-1 SOUND IS AN ELEMENT OF VIDEO RECORDING AND PLAYBACK THAT IS MUCH NEGLECTED. MOST TAPES I HAVE SEEN (AND ALAS, THAT I HAVE DONE) CONCENTRATE ON THE IMAGE; AUDIO TAKES SECOND PLACE. IT WOULD BE NICE IF THE SOUND TRACK OF SOME TAPES STOOD ON THEIR OWN, SO THEY COULD BE PLAYED OVER COMMUNITY RADIO, OR ENJOYED WITH CLOSED-EYES. ANYWAY, IT SHOULD COMPLEMENT THE VISUALS, AND CAN SOUND MUCH BETTER WITH A LITTLE CARE AND ATTENTION.



1-2 OR HOW'S ABOUT A LITTLE MORE SILENT VIDEO ... PLUG THE EARPHONE INTO THE EXTERNAL MIKE' INPUT. OR TURN OFF THE T.V. (WHAT AM I SAYING?!?). SERIOUSLY, REMEMBER TO SHUT IT OFF WHEN YOU'RE THROUGH; THAT HIGH-FREQUENCY HUM DRIVES MY EARS CRAZY. (WHAT, YOU DON'T HEAR IT? YOU'RE LUCKY, ABOUT 20% OF PEOPLE DO. I'M TOLD YOU LOSE SENSITIVITY TO THAT HIGH A NOTE OVER 30 YRS. OLD, BUT I'M NOT OVER THE HUMP YET.)
15,750 c.p.s.
WHAT AM I WRITING ABOUT? OH YES, SOUND.

PLAYBACK

2-1 BEFORE GOING INTO BETTER TECHNIQUES FOR RECORDING, I WANT TO MENTION PLAYBACK. THE TAPES YOU'VE ALREADY RECORDED CAN SOUND MUCH BETTER IF YOU PLAY THEM THROUGH ALMOST ANY SPEAKER BUT THE ONE ON YOUR \$600 T.V.; IF YOU PLAY IT THROUGH A DECENT SOUND SYSTEM, IT'LL SOUND QUITE GOOD! BASE AND TREBLE CONTROLS, TWEETERS AND WOOFERS, BALANCED SPEAKERS, ALL ENHANCE THE AUDIO PLAYBACK. YOU CAN CUT DOWN ON CERTAIN HISSES AND HUMS (THOUGH YOU LIKELY CAN'T ELIMINATE THEM COMPLETELY).

2-2 MOST STEREO SYSTEMS TAKE RCA TYPE PLUGS, SO A HANDY CABLE TO HAVE IS A 'MINI ↔ 2 RCA' } 'Y-CONNECTOR' }  { PLUG THE MINI INTO YOUR 'EARPHONE' OUT; THE RCA PLUGS INTO 'AUX. IN' ON THE 'AMP'. USING THE EARPHONE-JACK CUTS DOWN THE VOLUME COMING OUT THE T.V. SPEAKER (WHEN PLAYING BACK 'RF'); BUT THAT HAS NO EFFECT ON THE VOLUME OF THE AUDIO TRACK (WHEN RECORDING AND 'MONITORING' IT AT THE SAME TIME).

2-3 IF YOU HAVE A PRE-AMP AS WELL, YOU'LL HAVE TO BALANCE ITS VOLUME LEVEL WITH THE AMP. THE FIRST SHOULD BE LOW, OR THE SOUND WILL DISTORT. A SUGGESTION FOR BALANCING THE TWO IS - TURN DOWN THE PRE-AMP, AND TURN THE SECOND AMPLIFIER UP HIGH; THEN ADJUST THE FIRST FOR VOLUME. THIS IS ESPECIALLY IMPORTANT WHEN USING THE 'EXT. MIC.' INPUT TO THE VTR.

2-4 EVEN A PORTABLE AUDIO-CASSETTE RECORDER (PREFERABLY WITH AN 'AUX.' INPUT -  IS A SYMBOL SOMETIMES USED, RATHER THAN  ... THAT'S SUPPOSED TO BE AN EAR) WILL ADD TO THE SOUND QUALITY OF PORTAPACK PLAYBACK. BECAUSE ITS TONE IS DIFFERENT FROM THE T.V., IF YOU PLACE IT OFF TO ONE SIDE YOU CAN GET THE ILLUSION OF STEREO - GOOD FOR MUSIC, BUT NOT FOR PEOPLE TALKING (IN THE TAPE); IT DISPLACES THE VOICE AWAY FROM THE PERSON ON THE T.V. SCREEN, AND THIS CAN BE DISTRACTING. A GOOD CABLE IS THE STANDARD 'MINI ↔ MINI'. TO HEAR IT ON THE AUDIO RECORDER, PRESS THE 'RECORD' BUTTON (USUALLY RED). SINCE YOU'RE ONLY MONITORING THE SOUND YOU DO NOT HAVE TO RECORD IT - SO YOU DON'T NEED A CASSETTE IN IT, AND DON'T HAVE TO PUSH THE FORWARD BUTTON. (IT'S HANDY FOR PLAYBACK THROUGH THE CAMERA VIEWFINDER)
Also

MICROPHONES

3-1 IF YOU'RE GOING TO GET INTO GOOD SOUND, YOU SHOULD HAVE ONE DECENT 'EXTERNAL' MICROPHONE AT LEAST. (AN AKG-19, ^{SONY ECM-52} ELECTROVOICE 635 OR THEIR EQUIVALENT COSTS IN THE RANGE OF \$) A WIND-SCREEN SHOULD BE SLIPPED ON IT WHEN USING IT IN A WINDY ENVIRONMENT; THAT SMALL BIT OF FOAM RUBBER DOES A LOT TO PROTECT THE DELICATE MEMBRANE IN MOST MICROPHONES FROM THE VIOLENT RATTLE THAT WIND SUBJECTS IT TO, AND IT SOUNDS BETTER TOO. IF YOU DON'T HAVE ONE, USE A BIT OF CLOTH HELD AROUND THE FRONT OF THE MIKE BY AN ELASTIC OR SOME TAPE.



3-2 A GOOD MICROPHONE WILL PICK UP ANY NOISE OF ITS SHELL OR CORD, SUCH AS RATTLING, THE TAPPING OF YOUR RING, THE CORD PULLED TAUGHT, ETC. HANDLE IT QUIETLY, AND HOLD THE CORD SO IT DOESN'T FLOP AROUND. IF YOU PLACE THE MICROPHONE ANYWHERE (CHAIR, STRAPPED TO TOP OF CAMERA, ON A MIKE-STAND), PUT SOMETHING SOFT UNDERNEATH, LIKE FOAM, TO ISOLATE IT FROM RATTLE AND KEEP IT STILL.

SOUND

3-3 THE MICROPHONE BUILT INTO THE PORTAPACK CAMERA IS NOT INSULATED IN ANY WAY. BECAUSE OF THIS, IT PICKS UP ANY HANDLING SOUNDS OF THE CAMERA. SINCE I DANCE WITH THE CAMERA, HOLD IT SIDWAYS AND TURN IT UPSIDE DOWN, I'VE LEARNED TO WATCH OUT FOR CERTAIN RECURRING 'CREAKS' AND 'CLUNKS': TIGHTEN THE HANDLE BEFORE SHOOTING; WATCH THAT THE LENS HOOD DOESN'T DANGLE ON ITS STRING WHERE IT'LL BANG AGAINST THE HANDLE; HOLD THE CAMERA FIRMLY BUT QUIETLY; ETC.

4-1 — DIRECTIONALITY - THE CAMERA MIKE IS 'OMNI-DIRECTIONAL', THAT IS, IT PICKS UP SOUNDS WITH EQUAL SENSITIVITY FROM ANY DIRECTION; THE LOUDEST SOUND IS RECORDED LOUDEST, WHETHER OR NOT THE CAMERA IS POINTING IN THAT DIRECTION. HUMAN HEARING IS SELECTIVE - OUR EARS CAN LOCATE THE POSITION OF A SOUND SOURCE, AND OUR BRAIN CAN CONCENTRATE ON A SMALL PORTION OF SOUNDS COMING IN OUR EARS. (TO UNDERSTAND WHAT I MEAN, CLOSE YOUR EYES A COUPLE OF MINUTES AND JUST LISTEN TO THE SOUNDS AROUND YOU IN A WAY, AUDIO RECORDING IS SIMILAR TO THAT. MICROPHONES HAVE CERTAIN PHYSICAL RESPONSE TO SOUND STIMULUS; THE SOUND 'FUNNELED' IN IS FURTHER AFFECTED BY THE RECORDING SYSTEM, SPECIFICALLY BY THE 'AUTOMATIC GAIN-CONTROL' (described below) OF THE PORTAPACK.

4-2 *drawing* DIRECTIONAL MICROPHONES, QUITE COMMON, ARE MORE SENSITIVE TO SOUNDS COMING FROM ONE DIRECTION - THE ONE THE MIKE IS POINTED TOWARDS. OF COURSE, A REALLY LOUD SOUND COMING FROM BEHIND THE MIKE WILL BE RECORDED, BUT NOT NEARLY AS LOUDLY; AND SOUNDS OFF TO THE SIDES WILL BE PICKED UP, THOUGH NOT AS WELL AS THOSE STRAIGHT IN LINE WITH THE MIKE. MICROPHONE 'SPEC. SHEETS' (P.R. PAMPHLETS DESCRIBING THE CHARACTERISTICS, OR 'SPECIFICATIONS' OF THE MIKE) WILL SHOW THE ANGLE OF HIGHEST SENSITIVITY. HIGHLY DIRECTIONAL MIKES WILL PICK UP SOUNDS FROM VERY FAR AWAY, IF THEY ARE AIMED RIGHT AT THE SOUND SOURCE (see AUXILIARY EQUIPMENT & BOOM MIKES and PARABOLIC MIKES).

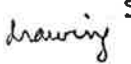
4-3 IF YOU ARE INTERVIEWING SOMEONE WITH A DIRECTIONAL MIKE, YOU MUST REMEMBER TO POINT IT TOWARDS YOUR OWN MOUTH WHEN YOU ARE SPEAKING. A GOOD SOUND PERSON POINTS THE MIKE SWIFTLY BUT QUIETLY WHEN THE SOUND SOURCE CHANGES.



5-1 BI-DIRECTIONAL MICROPHONES ARE QUITE RARE - YOU'LL FIND THEM IN OLD RADIO STUDIOS, BECAUSE THEY ARE REALLY GOOD FOR TWO PERSON INTERVIEWS, SITTING ON OPPOSITE SIDES OF THE MIKE.



5-2 CARDIOID MICROPHONES HAVE A HEART-SHAPED PICKUP PATTERN, THEY ARE FAIRLY DIRECTIONAL, BUT RESPOND BEST TO CLOSER SOUND SOURCES. BECAUSE OF THIS, THEY ARE GOOD MICROPHONES TO USE IN A NOISY ENVIRONMENT. THEY ARE NICE TO USE FOR INTERVIEWS AS WELL.



5-3 LAVALLIER, OR THROAT MICROPHONES ARE QUITE SMALL AND HANG ON A CORD AROUND THE NECK. THEY CAN BE WORN UNDER A JACKET OR SWEATER WITH LITTLE DROP IN SOUND QUALITY; AND THEY RESPOND VERY WELL TO THE HUMAN VOICE.

6-1 — THE HUMAN EAR PICKS UP FROM APPROX. 20 C.P.S. (CYCLES PER SECOND) - THE LOWEST NOTE WE USUALLY CAN DISTINGUISH, TO 15,000 C.P.S.. OUR VOCAL RANGE IS FROM ~ 50 C.P.S. TO 1500 C.P.S.. VIOLINS CAN GO AS HIGH AS 4000 C.P.S. BECAUSE OF THIS SOME MICROPHONES RESPOND BETTER TO CERTAIN RANGES, OTHERS MAY HAVE A SWITCH FOR 'MUSIC' OR 'VOICE'. ASK ABOUT THE 'FREQUENCY RESPONSE' OF AN EXPENSIVE MIKE BEFORE YOU BUY - ONE MIGHT BE GOOD IN A STUDIO BUT POOR OUT OF DOORS, ANOTHER MAY NOT LIKE LOUD SOUNDS, WHILE YET ANOTHER MAY PREFER THEM, ETC.

6-2 — A GOOD RULE OF THUMB (MY THUMB MEASURES ~1" FROM JOINT TO TIP OF NAIL, WHICH COMES IN HANDY FOR QUICK MEASUREMENT SOMETIMES... WHOOPS, THAT'S NOT WHAT I WAS SUPPOSED TO WRITE ABOUT.) - THE CLOSER THE MICROPHONE TO YOUR SUBJECT, THE BETTER THE SOUND WILL REPRODUCE; THOUGH YOU WILL USUALLY WANT TO KEEP THE MIKE OUT OF CAMERA FRAME.

6-3 ON THE OTHER HAND - LOUD SOUNDS WILL OFTEN DISTORT THROUGH A GOOD MICROPHONE, SO SPEAKING LOUDLY RIGHT UP AGAINST THE MIKE IS NOT A GOOD IDEA. A WINDSCREEN WILL ABSORB A LOT OF THE IMPACT, SPIT AND HOT AIR. (YEH!)

7-1 — THE MINI-PLUG OF THE EXTERNAL MICROPHONE NEEDS TO BE SECURE. WHEN YOU PLUG IT INTO THE V.T.R. IT CUTS OFF THE CAMERA MICROPHONE, SO THAT ONLY THE EXTERNAL MIKE RECORDS. IF IT'S NOT PLUGGED IN ALL THE WAY, OR IF IT SLIPS OUT A BIT, NEITHER MICROPHONE WILL WORK. BE CAREFUL IF THE CABLE IS LYING AROUND WHERE PEOPLE CAN STEP OR TRIP ON IT AND PULL OUT THE PLUG PARTWAY. TIE THE END OF THE MICROPHONE CORD AROUND THE CLIP OF THE PORTAPACK STRAP SO THAT THE PLUG CAN'T GET PULLED OUT.



7-2 *drawing* IF YOUR MIKE HAS A 'CANON' END, YOU WILL NEED AN ADAPTER CABLE. (see MODIFICATIONS SECTION.)
— MICROPHONE MIXERS - see AUXILIARY EQUIPMENT SECTION

SOUND

MONITORING A RECORDING

- 8-1 BEFORE GOING OUT, DO TEST THE QUALITY OF SOUND RECORDING, AT LEAST WITH THE EARPHONE IN WHILE HOLDING THE 'RECORD' LEVER. ONCE YOU ARE OUT IT MAY BE TOO LATE TO REPLACE A FAULTY CABLE OR MIKE. IF YOU HAVE THE TIME, DO A PROPER CHECK-OUT BY RECORDING A BIT OF PICTURE AND SOUND AND PLAYING IT BACK.
- 8-2 FOR THE BEST SOUND RECORDING, THE PERSON HOLDING THE MICROPHONE SHOULD BE MONITORING THE AUDIO THROUGH HEADSETS. I PREFER THEM NOT TO BE TOO SOUND-PROOF - THAT IS, I LIKE TO HEAR WHAT'S GOING ON AROUND ME AS WELL. WITH THE TINY EARPHONE PROVIDED, I HEAR TOO MUCH ENVIRONMENTAL SOUND, AND USUALLY CUP MY HAND OVER MY EAR. I GUESS THE BEST SITUATION POSSIBLE WOULD BE FOR BOTH CAMERA AND SOUND PERSONS TO HAVE HEADPHONES. USE HIGH-IMPEDENCE HEADPHONES.
- 8-3 WHEN MONITORING A RECORDING SESSION ON A T.V./MONITOR, KEEP THE T.V. VOLUME LOW TO AVOID FEEDBACK. THE LOUD SQUEEL THAT OCCURS WHEN THE MICROPHONE IS BROUGHT TOO NEAR THE SPEAKER IS RECORDED AND SURE SOUNDS TERRIBLE WHEN YOU PLAY IT BACK.
- 8-4 IF YOU PULL OUT THE EXTERNAL MIKE FROM THE DECK DURING RECORDING, THE SOUND LEVEL DROPS FOR A FEW SECONDS BEFORE ADJUSTING TO THE NEW LEVEL (NOT SUGGESTED).
- 8-5 WHEN YOU PLUG IN THE EARPHONE DURING RECORDING OR PLAYBACK, VOLUME OF THE T.V./MONITOR DROPS ABOUT 40%. DON'T WORRY, THE RECORDED SOUND LEVEL IS NOT SIMILARLY AFFECTED.

AUTOMATIC GAIN CONTROL (A.G.C.)

- 9-1 — THE PORTAPACK HAS A BUILT-IN A.G.C. IN ITS AUDIO CIRCUITRY. VOLUME (AUDIO GAIN) CANNOT BE CONTROLLED BY HAND. IF SOUND BEING RECORDED IS TOO LOUD, THE A.G.C. LOWERS THE RECORDING VOLUME; IF ENVIRONMENTAL SOUND IS QUIET, THE A.G.C. SEARCHES OUT THE LOUDEST SOUND AND INTENSIFIES IT. IN THIS WAY, THE SOUND RECORDING IS MAINTAINED NEAR A PRE-SET, OPTIMUM LEVEL. HOWEVER, THIS ALSO CAN LEAD TO PROBLEMS. EVEN WHEN ALL SEEMS QUIET TO THE EAR, THE A.G.C. WILL PICK UP THINGS LIKE THE HUM OF AN ELECTRIC TYPEWRITER, OR THE PORTAPACK DECK'S WHIRRING. CENTRAL AIR-CONDITIONING SLOWLY BECOMES A HISS THAT CAN DRIVE YOU CRAZY. IT'S NOT CONTROLLABLE EITHER, ^{SSS} THE ONLY WAY TO MAKE IT STOP IS FOR A LOUDER SOUND TO TAKE OVER, AND IT HAS A TENDENCY TO SNEAK IN WHEN OTHER SOUNDS STOP, LIKE GAPS IN THE MUSIC OR CONVERSATION. HISSSS. IF YOU ARE TALKING WITH SOMEONE, USING THE CAMERA MIKE, AND A LOUDER SOUND HAPPENS BY, LIKE A TRUCK OR PLANE FLYING OVERHEAD, THE TALK IS SUPPRESSED TO NEAR-WHISPER. IT TAKES A SECOND OR TWO AFTER THE LOUD SOUND HAS ENDED FOR THE CONVERSATION TO REACH ITS PREVIOUS LEVEL... WIERD! A GOOD DIRECTIONAL MIKE CAN HELP GET AROUND THIS, WITH ITS WINDSCREEN. THE A.G.C. IN TABLE DECKS IS MORE SENSITIVE THAN THE PORTAPACK'S, BUT THEY CAN BE SWITCHED TO 'MANUAL'. IF YOU HAVE A MANUAL GAIN CONTROL, USE IT IN A NOISY ENVIRONMENT.
- 9-2 — COPYING TAPES - THE A.G.C. WILL 'PICK UP ANY WIRES THAT ARE LOOSE OR SHORT-CIRCUITED AND TURN IT INTO A 'BUZZ'. WHEN TWO DECKS ARE HOOKED UP TOGETHER, THE CHANCES THAT THERE ARE LOOSE CONNECTIONS SOMEWHERE IN THE AUDIO CIRCUITRY OR CABLES INCREASE. IN SILENT PARTS OF THE ORIGINAL RECORDING, BUZZES AND HUMS APPEAR AND GET WORSE WITH SUCCESSIVE GENERATIONS OF COPIES. FOR THIS REASON, WHEN MAKING A COPY OF A TAPE, TRY TO USE A RECORDING DECK WITH MANUAL GAIN CONTROL FOR AUDIO (A.G.C. FOR VIDEO). SET THE AUDIO RECORDING LEVEL SO THAT IT MATCHES THE NEEDLE ON THE PLAYBACK DECK, OR ADJUST IT SO THAT IT PEAKS JUST BEFORE THE RED-ZONE ON THE METER (IT CAN GO OVER ONCE IN A WHILE).



AUDIO DUB (see also DUBBING section)

- 10-1 THIS FUNCTION ALLOWS YOU TO ERASE A SOUND RECORDING AND REPLACE IT WITH A NEW SOUND-TRACK, WHILE RETAINING THE PREVIOUSLY RECORDED PICTURE.
- 10-2 ON THE PORTAPACK, THE AUDIO-DUB LEVER IS LOCATED ON THE FRONT-RIGHT OF THE TOP OF THE DECK, UNDER THE LID. (ON THE COLOUR PORTAPACK, IT IS LOCATED OUTSIDE.)
- 10-3 FIND THE PORTION YOU WISH TO REPLACE, REWIND ^{TO} BEFORE THE START OF THAT SECTION, PLAY TO THE END OF THE SECTION BEFORE IT, THEN PULL THE 'STILL-FRAME' BUTTON (OR STOP THE DECK). PUSH THE AUDIO-DUB BUTTON TO THE LEFT, AND WHEN READY WITH THE NEW SOUND TRACK, START THE TAPE ROLLING. WHEN THE AUDIO DUB IS COMPLETED, STOP THE DECK. YOU CAN WATCH THE PICTURE WHILE DUBBING, BUT IF YOU ARE USING A MICROPHONE, TURN DOWN THE T.V. VOLUME, AND DON'T STAND NEAR THE V.T.R.. ALSO - GET PEOPLE AROUND TO QUIET DOWN, AND TAKE THE PHONE OFF THE HOOK. A VALUED MIKE

drawing

SOUND

'SOUND ON SOUND'

- 11-1 TO ADD NEW AUDIO TO A PREVIOUS RECORDING WITH ERASING WHAT'S 'UNDERNEATH' THERE ARE TWO METHODS:
- 11-2 WHEN RERECORDING THE TAPE ONTO A SECOND DECK (EDITING, OR COPYING THE ORIGINAL) YOU CAN 'MIX' SEVERAL SOUND TRACKS TOGETHER IF YOU HAVE AN AUDIO MIXER. A STEREO TAPE RECORDER WILL DO IT AS WELL. THE MIXER MUST HAVE INPUTS FOR 'HIGH' AND 'LOW' LINE LEVELS, OTHERWISE YOU CANNOT MIX OUTPUTS FROM RECORDINGS (0dB - SLIGHTLY AMPLIFIED) AND MICROPHONES (-60dB - NOT AMPLIFIED). THE TWO PLUGS ARE USUALLY DIFFERENT  'RCA' FROM TAPE RECORDERS,  'MINI' OR 'PHONO' FROM MICROPHONES.
- 11-3 A CHEAP TRICK IS THE 'FOLDED DOLLAR-BILL METHOD' (IF THE LOWEST YOU'VE GOT IS A 50-CENT) GO OUT AND BUY A MIXER WITH IT. IT'S QUITE SIMPLE - FOLD THE BILL LENGTHWISE, AND PLACE IT BETWEEN THE VIDEOTAPE AND THE AUDIO ERASE HEAD (THE FIRST HEAD THAT THE TAPE MOVES PAST; IT'S USUALLY BLACK). RECORD THE NEW INPUT AS YOU WOULD FOR 'AUDIO DUB', AND THE NEW SOUND WILL BE ADDED 'ON TOP' OF THE ORIGINAL AUDIO TRACK.
- 11-4 THIS METHOD IS PERFECT FOR ADDING A COMMENTARY INTO A RECORDING. IT DOES ERASE THE ORIGINAL AUDIO TRACK ABOUT 10-15% OFF ITS ORIGINAL VOLUME, SO USE THE \$BILL METHOD ONLY ON THE SECTIONS YOU WANT TO ADD TO. STOP THE 'AUDIO DUB' AS SOON AS THE COMMENTARY (OR ADDED MUSIC, ETC.) IS ENDED.

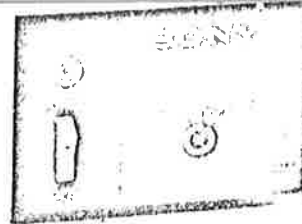
INTERFERENCE AND DISTORTION

- 12-1 YOU MAY SOMETIMES FIND STRAY SOUNDS UNEXPECTEDLY SHOWING UP IN THE AUDIO TRACK. SOME OF THEM ARE AVOIDABLE, BUT ONCE THEY ARE IN THE RECORDING, YOU CAN'T GET THEM OUT. BEFORE RECORDING ALWAYS DO A TEST - USE THE SMALL EAR PLUG, OR GOOD ^{HIGH-IMPEDANCE} HEADPHONES, OR PLAY IT BACK ON THE T.V./MONITOR.
- 12-2 WHEN RECORDING AND VIEWING AT THE SAME TIME, KEEP THE T.V./MONITOR'S VOLUME LOW. (SEE FEEDBACK SECTION).
- 12-3 DO NOT HOLD THE MICROPHONE NEAR TURNING DECK, OR THE MOTORS 'WHIRRING' WILL BE RECORDED IN THE BACKGROUND. CLOSE THE PORTAPACK LID AND LEATHER CASE.
- 12-4 WHEN AUDIO-DUBBING FROM PRE-RECORDED SOURCE ONTO THE PORTAPACK (THROUGH THE 'EXTERNAL MIC.' INPUT) KEEP THE VOLUME OF THE SOURCE LOW FOR MINIMUM DISTORTION BY THE A.G.C.
- 12-5 WHEN USING 'MANUAL AUDIO GAIN', DON'T 'OVERMODULATE'. THE NEEDLE SHOULD GO INTO THE RED ZONE ONLY RARELY.
- 12-6 AN 'UNSHIELDED' MICROPHONE HELD NEAR CERTAIN ELECTRONIC EQUIPMENT (INCLUDING A VIDEO CAMERA) MAY PICK UP A 'BUZZ'. DON'T INTERTWINE MIC. CORD WITH POWER CABLES.
- 12-7 BELL TELEPHONE 'PAGERS', POLICE RADIOS, CAR IGNITIONS, ELECTRONIC MUSIC SYNTHESISERS, ETC. EMIT R.F. FREQUENCIES WHICH CAN GET INTO THE AUDIO SYSTEM. (SEE MODIFICATIONS SECTION FOR 'BYPASS CAPACITOR.') IF YOU CONTINUALLY GET RADIO INTERFERENCE TRY CUTTING A SMALL LENGTH OFF THE MICROPHONE CABLE; IT MAY BE ACTING AS AN ANTENNA. SOME PEOPLE HAVE SUCCESS WRAPPING METAL FOIL AROUND THE CAMERA OR DECK (COPPER IS BEST). I DO KNOW OF ONE CASE WHERE HEADPHONES WERE PICKING UP 'BUGS' (BUT NOT THE MICROPHONE), SO THE INTERFERENCE WAS NOT RECORDED.
- 12-8 GROUND THE CASES OF ALL AUDIO EQUIPMENT TOGETHER.

SOUND ADVICE

- 13-1 WANT TO DO AN AUDIO DUB, BUT THERE'S NO MIC. AROUND? USE THE CAMERA OF THE PORTAPACK. IF YOU NEED TO DO IT ON AN EDITING DECK, YOU CAN STILL USE THE PORTAPACK AS A MICROPHONE BY CONNECTING 'EARPHONE-OUT' TO 'AUXILIARY-IN'. DON'T FORGET THAT THE MIKE IS NOT DIRECTIONAL, SO BE SURE IT'S QUIET ALL AROUND.
- 13-2 PLACE A PIECE OF CARPET OR FOAM RUBBER UNDERNEATH MICROPHONE STANDS, SO IT WON'T PICK SOUNDS UP OFF THE FLOOR.
- 13-3 USE A MONOPOD TO TURN A DIRECTIONAL MIC. INTO A 'BOOM' MIC. TO HOLD IT ABOVE A CROWD, FOR EXAMPLE. SUSPEND IT OVER MUSICIANS, FROM A BRANCH, A STAGE-RAFTER, ETC.
- 13-4 IN A PERMANENT STUDIO, A PARACHUTE ON THE CEILING IS A GOOD SOUND ABSORBER. IF YOU KEEP GETTING AUDIO INTERFERENCE FROM NEARBY TRANSMITTERS, YOU MAY HAVE TO SURROUND THE ROOM WITH COPPER SCREEN. ROUND THE EDGES AND CORNERS FOR BEST RESULTS.
- 13-5 BUILD A BOX LINED WITH FOAM FOR MICROPHONE RECORDING IN A 'LIVE' SPACE. IT'LL COME IN HANDY FOR AUDIO DUBS. CUSHIONS WILL DO IN A PINCH (CUTS DOWN NOISE + ECHO).

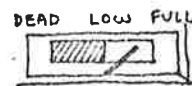
BATTERIES



F

1-1 — PORTAPACKS RUN ON 12 VOLTS, DIRECT CURRENT (12 VDC) - I.E. BATTERIES. THE BATTERIES MADE FOR PORTAPACKS AND PORTABLE TV./MONITORS ARE RE-CHARGEABLE, SO THEY CAN BE USED AGAIN AND AGAIN.

1-2 — PORTAPACK **BATTERY TEST** - THE BATTERY-LEVEL METER IS ON THE FRONT LEFT OF THE DECK. WHEN THE PORTAPACK IS RUNNING, THE NEEDLE SHOULD BE IN THE WHITE ZONE. WHEN THE NEEDLE APPROACHES THE RED ZONE, THE BATTERY IS DYING. THE METER DOES NOT REGISTER WHEN THE PORTAPACK IS IN 'REWIND'.



- IF THE PORTAPACK IS STOPPED AND THE BATTERY IS PLUGGED IN, PULL THE 'RECORD' LEVER TOWARD THE BAR AND HOLD FOR A FEW SECONDS. THIS WILL START THE VIDEO HEADS SPINNING, AND THE METER WILL REGISTER.

- IF THE BATTERY WAS QUITE DEAD AND WAS CHARGED FOR ONLY A SHORT TIME, AND IS TESTED SOON AFTER, THE NEEDLE MAY SHOW A GOOD CHARGE. DON'T LET IT FOOL YOU; IT WILL GO DEAD AGAIN QUICKLY.

- METERS ON DIFFERENT PORTAPACKS, EVEN OF THE SAME BRAND, DO NOT MOVE TO THE SAME ANGLE. TO FIND OUT HOW FAR THE NEEDLE MOVES AT FULL-CHARGE, TEST IT WITH THE AC ADAPTER. WITH IT YOU WILL GET MAXIMUM DEFLECTION OF THE NEEDLE; THE BATTERY IS FULLY CHARGED WHEN IT REACHES THE SAME ANGLE.

1-3 — WHEN THE BATTERY STARTS TO GET LOW DURING RECORDING, THE FIRST THING TO BE AFFECTED IS THE SMALL MONITOR IN THE CAMERA VIEWFINDER, WHICH GOES OUT OF FOCUS. IT WILL STILL RECORD O.K. FOR A WHILE. YOU CAN USE THE DISTANCE SETTING ON THE LENS TO FOCUS BY GUESSING YOUR DISTANCE TO THE SUBJECT. WHEN YOU PLAY IT BACK, THE FOCUS WILL BE ALL RIGHT. AFTER A WHILE, THE RECORDING STARTS TO BECOME UNSTABLE, WHICH MAY MAKE THAT SECTION DIFFICULT TO EDIT. AS THE BATTERY GETS REALLY LOW, EVEN THE PLAYBACK WILL BE UNSTABLE.

- IF A BATTERY IS DRAINED UNTIL IT IS COMPLETELY DEAD, IT WILL CUT BACK ON ITS CAPACITY. UNLESS IT IS AN EMERGENCY, DO NOT ALLOW BATTERIES TO RUN THEMSELVES RIGHT DOWN; EACH TIME YOU DO IT, YOU ARE SHORTENING THE LIFE OF THE BATTERY. USE THE AC ADAPTER WHENEVER POSSIBLE.

- THE TIME RATING OF A BATTERY INCLUDES 'STANDBY' TIME. A 45 MIN. BATTERY MAY RECORD A 30 MIN. TAPE.

THERE ARE THREE KINDS OF BATTERIES COMMONLY USED WITH VIDEO EQUIPMENT - GEL-CELL, THE 1/2 HOUR, INTERNAL BATTERY; NiCad (NICKEL CADMIUM), THE 3-HOUR, EXTERNAL BATTERY; AND ALKALINE BATTERIES, MOSTLY FOR TV./MONITORS.

2-1 — ALTHOUGH THEY ARE FAIRLY EXPENSIVE, (\$120), I STRONGLY PREFER NiCad BATTERIES (THE SONY BP-30). THEY CAN BE STORED FOR YEARS WITH LITTLE DECREASE IN PERFORMANCE, AND THEN AFTER A FEW CHARGE/DISCHARGE CYCLES BROUGHT BACK TO NORMAL PERFORMANCE. THE 'LIFE' OF A BATTERY IS RELATIVE TO ITS NUMBER OF USE CYCLES - MORE THAN 1,000 CHARGE/DISCHARGES FOR NiCad BATTERIES. THE AVERAGE 'MEMORY' OF THE BP-30 IS 3-4 HOURS. A GLANCE AT THE DISCHARGE CURVES SHOW THAT NiCad BATTERIES RETAIN A HIGHER VOLTAGE, LONGER, AND MORE STEADILY THAN OTHER KINDS OF BATTERIES. YES FOLKS, A REAL DREAM (I SOUND LIKE AN AD); IT'S WORTH THE INVESTMENT IN THE LONG RUN. (BUT DON'T OVERLOOK CHEAP MOTORCYCLE BATTERIES - SEE BELOW.)

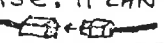


- THE NiCad BATTERY IS CAPABLE OF OPERATION OR STORAGE WITHIN THE FOLLOWING TEMPERATURE RANGES: STORAGE -40°C. (40°F.) TO +50°C. (122°F.); DISCHARGE -20°C. (-4°F.) TO +40°C. (104°F.); CHARGE +50°C. (111°F.) TO +40°C. (104°F.). TEMPERATURES LOWER THAN THOSE LISTED ARE WITHIN CAPACITIES OF THE BATTERY FOR SHORT DURATIONS. CHARGING AT LOW TEMPERATURES IS MORE LIMITED, AND SPECIAL LOW-RATE CHARGERS ARE NEEDED. MAINTAINED HIGH TEMPERATURES TEND TO CUT DOWN ON THE BATTERIES CAPACITY AND OPERATING LIFE, ALTHOUGH NOT ON ITS PERFORMANCE. BECAUSE OF THIS, IT IS IMPORTANT NOT TO OVERCHARGE THE BP-30 WITH ITS SMALL CHARGER; IT HAS NO LIMITING CIRCUITRY TO PREVENT CELLS FROM OVERCHARGING (WHEREAS THE AC ADAPTER/BATTERY CHARGER, THE LARGE, GREY AC3400, STOPS WHEN BATTERIES ARE FULLY CHARGED. AT LEAST IT DOES WHEN IT'S WORKING PROPERLY, WHICH ISN'T ALWAYS THE CASE. STILL, SOME PEOPLE FIND IT CONVENIENT TO ADAPT THE BP-30 SO IT'LL CHARGE, AND NOT OVERCHARGE, WITH THE AC-3400.). ~~(BUT)~~ HEAT SLOWLY MELTS AWAY THE NYLON POLARITY-SEPERATOR IN THE NiCad CELLS. DETERIORATION IS CUMULATIVE (THAT IS, IT DOESN'T GET BETTER WHEN IT COOLS OFF). IF YOU'RE LUCKY, THE FIRST (AND HOPEFULLY THE LAST) TIME YOU FORGET THE LITTLE CHARGER ON FOR TOO LONG, THE LITTLE BUGGER'LL BE HOT AS HELL AND MAYBE EVEN MELTED OUT OF SHAPE, THE BATTERY CELLS WILL BE AWFULLY WARM, BUT IT'LL STILL WORK O.K.

- THE NiCad BATTERY MAY BE OPERATED AT ALTITUDES UP TO 50,000 FEET, AS WELL AS UNDER HIGH PRESSURE.

ILLUSTRATION:
DISCHARGE
CURVES

BATTERIES

F

- 2-2 — NiCad BATTERIES MAY BE STORED IN ANY STATE OF CHARGE FOR INDEFINITE PERIODS. HOWEVER, IT SHOULD BE UNPLUGGED FROM THE DECK DURING STORAGE FOR MORE THAN A COUPLE OF WEEKS, OTHERWISE SLOW DRAIN OR A SHORT ACROSS THE TERMINAL MAY DAMAGE THE BATTERY. IT IS BETTER NOT TO STORE THE BATTERY AT A VERY LOW STATE OF CHARGE, WHERE POSSIBILITY OF AN INTERNAL SHORT-CIRCUIT IS GREATER. STORE IT DRY. EVEN THOUGH A NiCad BATTERY WILL EVENTUALLY LOSE ALL ITS CHARGE OVER PROLONGED STORAGE, IT CAN BE RETURNED TO SERVICE WITH NORMAL RE-CHARGE. THERE IS NO DIFFERENCE IN A BATTERY STORED AT PARTIAL-CHARGE AND USED RIGHT AFTER OR ONE FULLY-CHARGED, PARTICULARLY IF IT IS CHARGED AND DISCHARGED A COUPLE OF TIMES BEFORE PUTTING IT TO USE.
- 2-3 — MANUFACTURERS' SUGGESTED CHARGING TIME FOR NiCad BATTERIES IS 12-14 HOURS, HOWEVER YOU MAY FIND YOU'LL GET PEAK PERFORMANCE BY CHARGING FOR 12 HOURS, AND AGAIN 4 HOURS JUST BEFORE USE.
- THE CHARGER FOR THE BP-30 IS KEPT INSIDE THE BATTERY'S LEATHER CASE. IT CAN CONNECT TO THE BP-30 ONE WAY ONLY - THE PLUG HAS A TRIANGULAR AND A SQUARE EDGE.  NEVER PLUG THE SMALL BP-30 CHARGER INTO THE WALL AND RUN THE PORTAPACK OFF THE BATTERY AT THE SAME TIME. IT IS NOT AN AC ADAPTER, AND WILL OVERHEAT IN NO TIME AT ALL (I MEAN, FAST!).
- 2-4 — IF THE NiCad BATTERY IS DISCHARGED RANDOM AMOUNTS AND SUBJECTED TO VARIOUS USE CYCLES (AS IS USUALLY THE CASE WITH THE PORTAPACK), IT SHOULD PERFORM WELL. HOWEVER, IF THE BP-30 IS SUBJECTED TO A REPETITIVE DEPTH OF DISCHARGE, IT MAY SEEM TO LOSE ITS CAPACITY. (eg. USING THE PORTAPACK OVER AND OVER AGAIN FOR, SAY, TWO HOURS; AND RECHARGING EACH TIME). THIS IS A TEMPORARY LOSS. WHEN A CELL EXPERIENCES A REPEATED SERIES OF PARTIAL-USE CYCLES, IT BECOMES 'CONDITIONED' TO DELIVER ONLY SLIGHTLY MORE CAPACITY THAN HAS REGULARLY BEEN REQUIRED OF IT. IF THE CELL IS SUBJECTED TO A DEEP DISCHARGE AND IS THEN RECHARGED, THE SHORTER 'MEMORY' IS ERASED AND NEARLY ALL THE ORIGINAL CELL CAPACITY IS REGAINED.
- 2-5 — WITH USE, EVENTUALLY CERTAIN CELLS IN THE BATTERY-PACK GO DEAD BEFORE OTHERS. THERE ARE TEN 1.25 V CELLS IN THE BP-30. IF YOU CAN SCROUNGE A COUPLE OF DEAD BATTERIES, USE YOUR VOLT-METER TO DETERMINE WHICH CELLS HAVE GONE, AND COMBINE THE GOOD ONES TO GET A BP-30 THAT WORKS O.K. (SEE REPAIRS SECTION.)
- 2-6 — DO NOT LAY AN UN-INSULATED MULTI-CELL ASSEMBLY ON STEEL, AS THIS WILL 'SHORT' IT OUT. DO NOT USE UNINSULATED METAL TOOLS AROUND NiCad CONNECTIONS, AND REMOVE METAL OBJECTS SUCH AS RINGS, YOUR WATCH, ETC. WHEN HANDLING ^{DARE} CELLS WITHOUT GLOVES. SEVERE BURNS HAVE RESULTED FROM THE ARC THAT OCCURS WHEN THE BATTERY WAS SHORTED OUT. IF YOU GET ANY ELECTROLYTE (LIQUID FROM THE BATTERY CELLS) ON YOUR HANDS, WASH IMMEDIATELY AND NEUTRALIZE WITH A MILD ACID, SUCH AS VINEGAR.
- DO NOT PLACE NiCad CELLS IN A FIRE (LIKE AN INCINERATOR) 
 - IT IS RECOMMENDED THAT NiCad BATTERIES NOT BE DEEPLY DISCHARGED VERY OFTEN. BECAUSE DIFFERENT CELLS IN THE BATTERY-PACK HAVE SLIGHTLY DIFFERENT CAPACITIES, ONE OR MORE CELLS RUN DOWN BEFORE THE OTHERS, DRAINING ENERGY OFF THE GOOD CELLS TO CHARGE THE WEAK ONES, AND CUTTING DOWN THE BATTERY'S TOTAL STORAGE CAPACITY.
 - BATTERIES SHOULD NOT BE OVERCHARGED VERY OFTEN, AS EXCESS GAS PRESSURE DEVELOPS, DRYING OUT THE CELLS. 
- 3-1 — GEL-CELL BATTERIES, WHICH GO INSIDE THE PORTAPACK, ^{USUALLY} LAST ABOUT 30 MINUTES, ALTHOUGH THEY ARE RATED AT 45 MINUTES. IT'S PROBABLY A GOOD IDEA TO HAVE A SECOND ONE AROUND WHICH YOU KEEP FULLY CHARGED. I NEVER GOT A GEL-CELL BATTERY, AS I PREFER THE NiCad, AND I'VE RARELY REGRETTED THAT DECISION. MIND YOU, DON'T FEEL YOU'VE BEEN RIPPED OFF IF THAT'S WHAT YOU BOUGHT; TREATED WELL, IT'LL SERVE YOU WELL.
- 3-2 — INTERNAL GEL-CELL BATTERIES (SONY BP-20 OR EQUIVALENT) REQUIRE 8 TO 10 HOURS TO BE FULLY CHARGED. YOU CAN CHARGE TWO BATTERIES AT THE SAME TIME BY LEAVING ONE IN THE PORTAPACK, PLUGGING THE AC ADAPTER/CHARGER INTO THE DECK, ^{USUALLY} CONNECTING THE SECOND BATTERY TO THE FRONT OF THE CHARGER. (DRAWING) THE INDICATOR ON THE CHARGER WILL SHOW WHEN THE BATTERIES ARE FULLY CHARGED.
- LIMITING-CIRCUITRY BUILT INTO THE AC ADAPTER/CHARGER STOPS SUPPLYING POWER WHEN BATTERIES ARE FULLY CHARGED, THUS PREVENTING OVER-CHARGING. HOWEVER, BECAUSE ON SOME CHARGERS THIS MECHANISM MAY BE FAULTY (IT'S NEVER HAPPENED TO ME, BUT HAS TO FRIENDS), IT IS ADVISABLE NOT TO CHARGE FOR MORE THAN 24 HOURS. (ESPECIALLY IF THE CHARGER IS BORROWED).
 - YOU CAN LEAVE THE GEL-CELL BATTERY IN THE PORTAPACK WHEN RUNNING THE DECK OFF AC; EVEN IF THE AC ADAPTER IS ON AND THE DECK IS NOT RUNNING, IT WILL 'TRICKLE-CHARGE' THE INTERNAL BATTERY AND MAINTAIN IT AT FULL-CHARGE

BATTERIES

- 3-3 **TO REMOVE THE BP-20 FROM THE SONY AV3400** (~~REMOVE THE BATTERY FROM THE DECK~~) - UNPLUG ALL WIRES GOING INTO THE DECK (AC ADAPTER, CAMERA, RF-ADAPTER, ETC.) AND LIFT IT OUT OF ITS LEATHER CASE. UNDERNEATH THE PORTAPACK IS A SMALL DOOR. TAKE THE LARGE PILL THAT SAYS 'EAT-ME' (OOFS, SORRY. THAT'S THE WRONG STORY). OPEN IT BY UNSCREWING THE LATCH WITH YOUR FINGERS; USE A COIN IF IT IS STUCK. LIFT THE LEFT SIDE OF THE BATTERY PART-WAY OUT, AND SLIDE THE BATTERY OUT GENTLY - IT'S GOT AN UMBILICAL-CORD, SO DON'T YANK IT. UNPLUG THE CONNECTING WIRE (DRAWING). CAUTION - DO NOT PULL ON THE BATTERY TO UNPLUG IT. HOLD ON TO AND CAREFULLY PULL DOWN ON THE PLUG. THE BP-20 HAS A BAD HABIT OF THE WIRE WEARING-OUT WHERE IT'S CONNECTED TO THE BASE OF THE BATTERY. IF THE STRIP OF TRANSPARENT PLASTIC WHICH GOES AROUND THE BATTERY HAS TORN OFF, REPLACE IT WITH TAPE, (DRAWING) SO THE WIRE WON'T MOVE AROUND, WEAR-OUT, AND SHORT-CIRCUIT. (IT'LL START TO SMOKE AT FIRST, THEN CORRODE, IF YOU CATCH IT WHEN IT STARTS AND REMOVE THE BATTERY, IT SHOULDN'T CAUSE ANY DAMAGE TO THE DECK.)
- 3-4 **TO REPLACE THE BP-20**, PLUG IT INTO THE JACK INSIDE THE TOP LEFT OF THE DOOR (ILLUSTRATION); THERE'S A DRAWING INSIDE THE DOOR SHOWING YOU WHERE. SLIDE THE RIGHT SIDE OF THE BATTERY IN, AND PUSH IT DOWN FLAT. MAKE SURE THE CORD IS TUCKED IN BEFORE SHUTTING THE DOOR.
- 3-5 **STORE GEL-CELL BATTERIES FULLY-CHARGED**. THEIR SELF-DISCHARGE RATE IS ~2° PER MONTH. WHEN THEY'VE BEEN LYING AROUND UNUSED, CHARGE FULLY BEFORE USE.
- 4-1 **THE ALKALINE BATTERY (BP-W/564 OR EQUIVALENT)** IS DESIGNED FOR USE WITH 9" AND 5" (PICTURE DIAGONAL) PORTABLE T.V./MONITORS. IT IS VERY IMPORTANT TO FOLLOW THE MANUFACTURERS' CHARGING INSTRUCTIONS. THE BATTERY WAS DESIGNED TO GIVE A TOTAL USE (CONTINUOUS OR INTERRUPTED) OF 3 HOURS WITH THE 9", AND 4 HOURS WITH THE 5" TV/MONITOR. IT CAN WORK 7-10 HOURS IN AN EMERGENCY, BUT THAT WILL KILL THE BATTERY. THE ALKALINE BATTERY CAN BE RECHARGED UP TO 40 TIMES IF USED PROPERLY, AND IT SHOULD BE USED FROM TIME TO TIME. (WE ONCE LET A TV. BATTERY GO UNUSED ONE WINTER... IT WENT DEAD AND WOULDN'T RE-CHARGE.) WHEN THE BATTERY IS WORN OUT (AS EVIDENCED BY A SHORTENING OR NARROWING PICTURE), REPLACE IT WITH ANOTHER 13.5V. ALKALINE BATTERY, SUCH AS EVEREAD MODEL 564. WHEN THE BATTERY IS NOT IN USE, REMOVE FROM ITS CASE AND STORE IN A COOL, DRY PLACE.
- 4-2 **WHEN YOU FIRST BUY AN ALKALINE BATTERY**, WHETHER OR NOT YOU NEED TO USE IT RIGHT AWAY, RUN IT FOR THE MAXIMUM ALLOTTED TIME AND RE-CHARGE. DO NOT CHARGE IT THE FIRST TIME AFTER PARTIAL USE, OR YOU WILL SET THAT AMOUNT OF USE-TIME AS THE STORAGE 'MEMORY' OF THE BATTERY.
 - AFTER THE FIRST CHARGE, YOU MAY USE THE BATTERY FOR SHORT PERIODS OF TIME AND RE-CHARGE, CAREFULLY FOLLOWING THIS SCHEDULE: IF 9" SET IS USED 1 HOUR, CHARGE 4 HOURS; 5" SET, CHARGE 3 HOURS; AFTER 2 HOURS USE, CHARGE 9"-8 HOURS, 5"-6 HOURS; AFTER 3 HOURS USE, CHARGE 9"-12 HOURS (THE MAXIMUM), 5"-9 HOURS; AFTER 4 HOURS USE WITH THE 5" SET (ONLY), CHARGE 12 HOURS (MAXIMUM). HOWEVER, IT IS HIGHLY ADVISABLE TO KEEP A LOG ON NOTE-PAPER (TAPED INSIDE THE BATTERY CASE), RECORDING HOW LONG IT IS USED EACH TIME - THEN CHARGE ONLY AFTER IT HAS BEEN DRAINED THE ADVISED MAXIMUM EACH TIME. THIS IS EASY IF YOU USE IT WITH THE SAME SIZE MONITOR ALL THE TIME, THOUGH IT'S NOT NECESSARY. IN ANY EVENT, FROM TIME TO TIME YOU SHOULD PLAY THE BATTERY ITS SUGGESTED MAXIMUM AND CHARGE IT UP, TO PREVENT IT FROM GOING DEAD.
- 5 **DISCONNECT THE INTERNAL GEL-CELL BATTERY WHEN USING AN EXTERNAL NiCad BATTERY**, OTHERWISE IT CUTS DOWN THE POWER OF THE EXTERNAL BATTERY AS IT ATTEMPTS TO CHARGE THE INTERNAL ONE. SOMEONE TOLD ME THAT IF YOU PLUG A BP-30 IN WITH A DEAD BP-20 IN THE DECK IT'LL BLOW THE FUSE; BUT I'VE NEVER TRIED IT.
 - IF THE DECK IS RUNNING ON THE INTERNAL BATTERY AND YOU WANT TO CHANGE TO THE AC ADAPTER (GOOD IDEA - IT'LL SAVE THE BATTERY!), TURN OFF THE PORTAPACK BEFORE PLUGGING IT IN, OR IT'LL BLOW A FUSE. NEVER PLUG IT IN WITH THE AC ADAPTER ALREADY SWITCHED ON AND THE DECK RUNNING; I'M TOLD IT CAN SHORT OUT AND KILL THE BP-20.
 - WHEN REMOVING THE EXTERNAL POWER SOURCE (AC ADAPTER, BP-30, ETC.), GRIP THE PLUG FIRMLY. IT IS QUITE FLIMSY, AND WILL START TO LOOSEN IF YOU PULL ON THE CABLE.
 - TURN OFF THE AC ADAPTER BEFORE UNPLUGGING IT FROM THE DECK.
- 6 **MOTORCYCLE BATTERIES (12V.) ARE INEXPENSIVE AND WORK WELL WITH VHS.** THEY SHOULD NOT BE JOSTLED AROUND TOO MUCH - IN FACT, KEEP THEM AS HORIZONTAL AS POSSIBLE, OR THE ACID WILL LEAK OUT. USE A "PREH" 4-TRONG ENDING ON THE CABLE.
 - ADAPTERS ARE AVAILABLE SO THAT YOU CAN PLUG PORTAPACKS INTO THE CIGARETTE LIGHTER RECEPTACLE IN CARS WITH 12V. BATTERIES.