RAMBIT

THE ORIGINAL TURBOCHARGER

FOR ATARI DATA-RECORDERS

RAMBIT

UTILITY FOR HIGH SPEED RECORDING AND LOADING OF MACHINE CODE PROGRAMS
FOR ATARI 64K 600XL, 800XL AND 130XE COMPUTERS WITH 410, 1010, XC11,
XC12 OR PHONEMARK DATASETTES.

The aim is to load your software under RAMBIT control, convert and save
to tape such that the new recording can be loaded by the same technique
as the original, but around 6 times faster.   Conversion is mainly
automatic although some   non-standard   programs   may need slight
adjustment as instructed or manual sorting.
VI occupies the top 2.75K of free memory leaving that amount short for
source program manipulation, it can be used with cartridge such as
ASSEMBLER/EDITOR but lacks the auto-handling of other than single stage
programs.
VII is self dependant using OPTION + SELECT to reset, runs with normal
operating system disabled leaving all the normal free memory for
program manipulation and is disabled by the RESET key.

TYPICAL PROCEEDURE FOR CONVERTING YOUR PROGRAM.

1. Load RAMBIT into your machine by switching on with OPTION + START
keys depressed. A "beep" will tell you that the Atari is ready to load
RAMBIT, (rewind tape if not already rewound) press 'PLAY' on the tape
deck and press any key, RAMBIT will now load (supplied tape has two
copies per side).
2. Place source tape in player and depress 'PLAY' button, referring to
the flow chart/command instructions, type 'L' or 'R' as appropriate and
RETURN. The motor will start and the program will load until either
'OK', 'ERROR --' or start screen appears.   (SEE APPENDIX FOR ERROR
CODES).
3. After successful load (and conversion), replace source tape with
your blank tape, note counter reading and press 'RECORD' and 'PLAY'
buttons. Type 'S' and RETURN, select for XC11 or other type of
recorder then, after a double "beep" press RETURN again; recording will
commence & after some seconds the screen will blank, until 'OK'
indicates successful completion.
4. Rewind cassette to noted counter reading + 3 or 4, press 'PLAY'
button, type 'V' and RETURN. The recording will be checked against the
memory until 'OK' confirms success. Should ERROR occur repeat 4 with
slight alteration to start counter reading.   If ERROR still occurs
repeat steps 3 and 4, or try another blank cassette.
5. For possible causes of failure to record satisfactorily refer to
Appendix.

PROGRAM CONVERSION

RAMBIT high speed copy consists of a short normal speed section
followed by the main section recorded at FAST rate (average 3500 baud)
in one of two formats described later.
This conversion is not always easy but by following the supplied flow
chart success can be achieved with many.   Failure to obtain working
copies may be due to the source program disabling RAMBIT program when
loaded or protection obscuring the software's start address.

COMMANDS

All RAMBIT commands are single letter followed by parameters and
operators as applicable, they are effective when return is pressed and
are completed by printed message indicating success or otherwise.
All parameters are in hexadecimal format – full 4 figure addresses and
2 figure data separated by operators as described with each function.
Error codes (refer to Appendix) are hexadecimal Atari standard, with
the exception of '93' (which occurs when an attempt is made to use
memory above the base of RAMBIT, either by loading too large a program,
or direct action) and 'FF' which indicates that when attempting to save
there is no block count, either in program first two bytes or locations
$98 and $99. When default values are used please note that VI default
is $0700 and VII default is $0500.

CXXXX<ZZ,----,ZZ.. Changes stored values to ZZ starting at address
$XXXX, a maximum 8 consecutive locations may be altered with this
command. Intermediate locations not requiring alteration are indicated
by commas. E.g. C1010<FF,01,,,EA would insert the values as follows:-
$1010 would contain the value $FF, $1011 would contain the value $01,
$1012 and $1013 would remain unchanged, $1014 would contain the value
$EA.

D   .... displays 8 consecutive bytes from the default address.
DXXXX .... displays 8 consecutive bytes from $XXXX.
DXXXX,YYYY displays memory from $XXXX to $YYYY in blocks of 8. (Can
be paused by CONTROL 1).

F   .... loads at the default address a program which has been
saved using 'S'. Cassette 'PLAY' button should be pressed before
RETURN; 'OK' indicates success, when program can be saved by 'S'.
Insufficient memory for program would give 'ERROR 93'. Incorrect start
position on tape or bad tape, would usually give 'ERROR 8F'.
FXXXX .... fast LOADS a program beginning at $XXXX.

GXXXX .... RUNS a program starting at $XXXX.

L   .... loads a program in standard Atari $80 byte blocks starting
at the default address.
LXXXX .... loads a program starting at $XXXX. A single "beep"
indicates press 'PLAY' on cassette; loading commences on a further
press of RETURN and unless a load error occurs, continues until the
end of the file or the end of free memory is reached. Hi/Lo block
count is saved in Hex format at $98, $99. (Program length No. of
blocks)

MZZZZ<XXXX,YYYY.. moves a block of memory that starts at $XXXX and ends
at $YYYY to memory location $ZZZZ.

VII Only Q   ....Boot-loads (as OPTION+START pressed) source program (up to
48K) from cassette. When loaded, re-entry to RAMBIT by pressing OPTION+
SELECT leaves the program unaltered for examination. Memory $0000-$03FF
is stored at $C000-$C3FF for examination of program variables, vectors,
start addresses etc.. Tentative testing of run addresses listed from
'R' can be done using 'G'. This form of experimentation is useful to
establish which of these vectors is the TRUE start address. If you are
successful i.e. the program restarts then Well done!, but if the
program does not start it may be necessary to reload and try another
address using 'G'. Note, 'Q' will also load RAMBIT conversions.

2

VII Only R   ....Boot loads as 'Q' but converts the program to Pseudo-binary
format (see "HI-SPEED FORMAT") ready to be saved from $0500 using
'SRETURN', a list of possible run addresses (Lo/Hi pairs) is stored at
$C040-C0FF. Load the source program with 'R', immediately loading is
complete press OPTION + SELECT to convert the program. Whilst
conversion is taking place 'PROCESSING' is displayed on the screen, a
few seconds later conversion is complete and we return to RAMBIT. Write
down the list of possible values which is displayed with 'DC040,C090'
followed by 'DC098,C0FF' omitting any pairs that appear more then once
ie.

        C040 20 73 42 55 45 4E 3D 34
        C048 4C 3D 3D 38 4C 41 41 44
        C050 4C 0D 41 44 42 55 00 30
        C058 .. ETC.

D RETURN will display the beginning of your converted program where the
first two bytes are the block count ie. $FE $4F.
Next using 'C' and 'S' save 3 copies with the value of $050F at $00,$01
and $02 in turn, verify each with 'V' before changing the value to the
next (ie. C050F<00 as appropriate).Test run each of the 3 copies by
normal BOOT start (or 'Q'), if none of them run retry using TRANSLATOR
if you have it, make further copies of the successful version with 'F',
'S' & 'V'. Note some testing can be carried out with 'Q' although the
final test is with normal BOOT start. When these steps fail,
substitution of values from your written list becomes necessary as
follows:- first load one of your failed copies with 'F RETURN', change
$050F to $02 with the command 'C050F<02', 'D050F' command will display
this change. Next select a pair of values from the written list ie.
0030 and substitute in $0508,9 with command 'C0508<00,30'. You may
prefer to save several copies with different substitutions all at once.
Save, verify and test as before, if not successful repeat with other
values from the list. Do not give up too soon, although some programs
can only be converted using programming knowledge with the L command
and machine code monitor, most programs can be converted in this
manner. (If at first you don't succeed ....).

S   ....saves program stored at default address to cassette in
RAMBIT Hi-speed format. Identification of recorder (XC11 or other) is
requested then double "beep" indicates press 'RECORD' and 'PLAY'
buttons, RETURN then starts recording. The only requirement is that
the first 2 bytes contain either block count, or $FFFF with block count
stored at locations $98 and $99. Note the screen will go blank during
save operation.
SXXXX ....saves from SXXXX as above.

V   ....verifies Hi-Speed program against that stored in memory at
default address; any discrepancy returns 'ERROR 8F'. This command can
also be used to find the end of any RAMBIT saved program on tape, as
'V' reads up to the end of data on tape as determined by header block
count (Ended by ERROR when simply locating program end).
VXXXX ....verifies from SXXXX as above.

X   ....exits (Version I only) to utility cartridge when present,
otherwise prompts '??'.
With monitor cartridge present RAMBIT can be loaded as follows:- Switch
on then....
XL change $0008 to $00, $03E9 to $01, then GC400.
Ommimon change $0008 to $00, $004A to $01 then JF3AC and press start.
Re-entry is by G to the value stored in $000A & B e.g G9209

Z   .... fills from default to base of RAMBIT with zeros.
ZXXXX   .... fills from $XXXX to   base of RAMBIT, and ZXXXX,YYYY from
$XXXX to $YYYY-1.

HI-SPEED FORMAT

The two high-speed formats available to the user are (i) Standard Boot
and (ii) Pseudo-Disk Binary file.
The program's leading byte (i.e. at   start address for 'S') identifies
the format to RAMBIT ie other   then $FF   or FE   denotes Standard Boot
format.   Some commercial programs use this byte which is acceptable
in RAMBIT format provided its value is between $FD and $02.
'S' command automatically appends the appropriate slow part during fast
recording of the program, total size defined as blocks of $80 in the
first two bytes.
(i) This format has a 2 block slow part, which loads to $0080-017F,
followed by one main section with the first 6 bytes at its front end
containing size, location and running information similar to ATARI
standard (see appendix). Block count can be in range of 0001-01FF.
(ii) This is a continuous data block identifiable by having a leading
byte value of $FF or $FE, ended with minimum 4 zeros and having a slow
section of 3 blocks which loads at $0700 (Version I) and $BE00 (V.II).
It is recommended that note is made of the version used during
conversion so that future copies can be recorded similarly.
Bytes 0 & 1 define the total program size (range FE01-FFFF which
corresponds to 0001-01FF) and are followed by one or more data blocks
each preceeded by the start and end load addresses for that block.

APPENDIX

ERROR CODES

80 Operation aborted by break key.   88 End of file.
89 Truncated record.   8A Time out. (i.e. start
8C Serial framing error.   not found)
8E Serial data overrun.   8F Check sum error.
90 Device error.
93 Insufficient memory for operation, or would corrupt RAMBIT.
FF No program length for 'S' command either in first 2 bytes of program
header or stored in $90 and $99.
01 Program too big - successfully loaded to end of free RAM.

MISCELLANEOUS

Possible causes of recording failure are poor cassette tape, datasette
too close to TV or Atari, cable plugs not home properly or pushed out
of line, incorrect starting point on tape for verification (too early
or too late), dirty heads on datasettes, insufficient tension on tape
pinch roller, slipping belts etc.

RAMBIT standard boot loads at $0080-$017F. Pseudo-binary boot loads at

RAMBIT standard boot loads at $0080-$017F. Pseudo-binary boot loads at $0700-$0880 (VERSION I) or $BE00-$BF80 (V.II).

When converted with 'R' $0506-$0516 corresponds to $0000-$0010 of the original program.

Further Binary copies should be made using the Version with which they were converted, to avoid overwriting loading boot ($0700 or $BE00).

The only interrupt enabled during fast loading is IRQ vectored via $0216 & 7.

Default address for Version I is $0700 and for VII is $0500

Maximum that can be saved version I is $0000-B0FF, V II is $0000-BFFF.

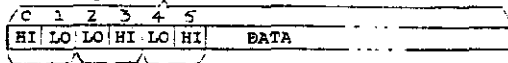$0098 & 99 Hi/Lo must contain block count for saving binary file as loaded by 'L' (ie. headed by FF,FF), when automatic adjustment is made for running of mid-load initialisation code (vectored $02E2,3).

Zero page $38-3E is used during loading of pseudo-binary, loading to these locations will cause problems.

Program size is number of bytes divided by $80 rounded upwards.

Representation of Standard header format:-

Total as in bytes 0 & 1

```
 /C  1  2  3  4  5
| HI| LO| LO| HI| LO| HI|    DATA
      size ld. add. init. addr.
```

Version II is generally reset with OPTION + SELECT.

Version II will not function with cartridge present.

Altering $050E to $FF in 'R' converted programs forces warm start at end of high speed loading, this may solve non-running problems.

RAMBIT does not handle BASIC programs at present, but may do in the future.

RAMBIT converted programs are loaded using Boot-start ie switching on with OPTION + START pressed,

RAMBIT has been found to be very reliable, but we recommend the use of good quality ferric tapes.

In some cases when using 'R' exit to RAMBIT may be gained at the last possible movement before load is complete, ie by counter reading.

Specialised conversion may be possible by allowing 'R' to BOOT ERROR (PLAY unpressed) then using 'L', 'C', 'M' & 'G' to sort before finally pressing OPTION + SELECT to convert as usual.

APPROACH TO PROGRAM CONVERSION

ENTRY

Is SOURCE PROGRAM KNOWN OR SUSPECTED SINGLE STAGE? — N →

NOTE

2 STAGE WITH SHORT FIRST STAGE TYPICALLY 5 BLOCKS? — N →

NOTE

USING VERSION II ONLY. LOAD PROGRAM USING 'R' RETURN. (DO NOT START PROGRAM WHEN LOADED NORMALLY)

NOTE

USING VERSION I OR II LOAD PROGRAM WITH 'L' RETURN (Y)

LOCATE START OF 2ND PART. LOAD WITH 'L' RETURN USING VERSION I OR TRANSLATOR VERS' (Y)

OK? (GRAPHICS MAY NOT BE 100%) — N →

TRY AGAIN IF NO SUCCESS. ! TOO COMPLICATED FOR DIRECT CONVERSION.

LOADED OK? — N

LOADED OK? — N

ENTER RAMBIT BY PRESSING OPTION + SELECT KEYS (Y)

SAVE WITH 'S' RETURN VERIFY WITH 'V' RETURN. (Y)

DISPLAY HEADING DATA WITH 'D' RETURN OR D0700, 0708 (Y)

OK? — N →

DESTROYS RAMBIT. ! MAY POSSIBLY BE CONVERTED WITH PROGRAMMING SKILL USING 'L' COMMAND + MONITOR CARTRIDGE (VERSION I)

DISPLAYED DATA IS 0700 FF FF...? — Y / N

DISPLAY POSSIBLE START VECTORS WITH D'C040,C0FF AND WRITE DOWN PAIRS FOR LATER. (Y)

TEST SAVED COPY BY LOADING AS BEFORE CONVERSION IE WITH OPTION + START.

AFTER RETESTS.

SAVE WITH 'S' RETURN. VERIFY COPY WITH 'V' RETURN. TEST SAVED COPY BY USING NORMAL BOOT LOAD (OPTION + START)

RUNS OK? — N →

RELOAD RAMBIT ENTER SAVED COPY WITH 'F' RETURN SUBSTITUTE VECTORS FROM YOUR WRITTEN LIST WITH 'C' COMMAND, SAVE VERIFY AND RETRY. — N →

RUNS OK? (Y)

SUCCESS MAKE FURTHER COPIES FROM THIS COPY

SUCCESS

NOTE

SINGLE STAGE will load entirely within one 'L' operation and the second byte of the program seen by typing I will be the similar to that at $0099 on completion of loading TWO STAGE with 'L' will load up to the end of part 1 (generally), when typing L again loads the second stage.

GUARANTEE

The interface is guaranteed against faulty workmanship for three months and will be repaired/replaced or money refunded at our discretion. Updates and re-recocording will be available on return of original tape with covering postage, For any other difficulties, please write giving FULL details and we will do our best to help. Both program and interface are copyright of :-

RAMBIT (c)

16 THE GREEN, THURLBY, BOURNE, LINCS. PE10 0HB.

TELEPHONE 0778 424450

LOOKING AT YOUR 1010 CASSETTE RECORDER -
a) IF THE STOP/EJECT KEY IS ON THE EXTREME RIGHT USE THE INSTRUCTIONS ON THIS SHEET.
b) IF THE PAUSE KEY IS ON THE EXTREME RIGHT USE OTHER SHEET.

FITTING RAMBIT TO YOUR ATARI 1010 RECORDER

ELECTRONIC COMPONENTS ARE LIABLE TO BE DAMAGED BY STATIC ELECTRICITY AND SO TO AVOID SUCH DAMAGE IT IS ADVISABLE TO DISCHARGE YOURSELF BY TOUCHING SUCH AS METAL WATER PIPES OR TAP BEFORE & DURING HANDLING & WORKING ON YOUR CASSETTE.

Remove the 4 screws from the base and seperate the two halves of the unit, turn the top half face down.
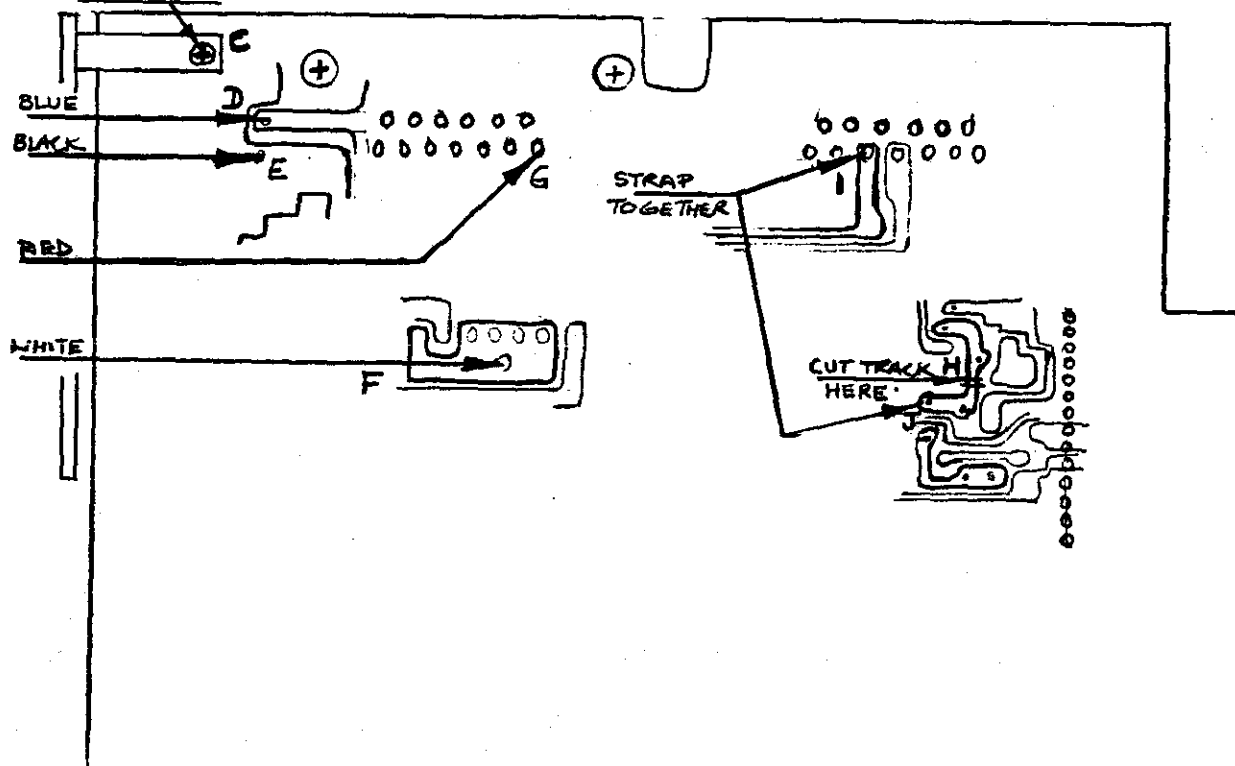
The first job referring to the diagram cut the circuit track at point H and join the two points I and J together with strap wire supplied.

Next fit RAMBIT circuit board under screw C with board components facing up, carefully fold down side of main cicuit and fold wires up. Take 4 wires and solder BLUE to D, BLACK to E, WHITE to F and RED to G.

Check the security of wire connections, ensure that there is no solder bridging tracks and reassemble the unit.

Your datasette is now ready for testing and should have all it's old facilities plus that of HIGH SPEED RAMBIT.

FIX RAMBIT BRACKET UNDER SCREW AND BEND DOWNWARDS.

Having fitted the interface and reassembled your cassette it is time to test it. Connect up computer cassette etc, place RAMBIT tape in cassette press PLAY, hold down START/START & OPTION and switch on ETC as usual. Tape should drive until after 30 seconds approx 'LOADING' plus rapidly changing characters should appear on the SCREEN followed after 15 seconds by blue screen with 'RAMBIT' in top left. RAMBIT has loaded high speed-you are now ready to use the utility-turn to operating instructions.
If by some rare misfortune all did not go to plan work through steps below to attempt a solution.

a) DID TAPE DRIVE?
   YES   NO→TRY FAST FORWARD & REWIND
          O.K. NO-Check belts inside for correct position/touching wires etc.
                YES-Attempt another load

b) Did you get LOADING ?
   YES   NO→Try next copy on tape or otherside-still no,success try one of your
          regular programs if ok contact us, if not check your work and retry.

c) Did you get changing characters ?
   YES   NO→ Check fitting work & retry before contacting us.

   Try other copies of RAMBIT. (2 ON EACH SIDE)
       O.K. NO   interface OK so do checks as operating instructions-if no joy
                  contact us

FITTING RAMBIT TO YOUR ATARI 1010 RECORDER

ELECTRONIC COMPONENTS ARE LIABLE TO BE DAMAGED BY STATIC ELECTRICITY AND SO TO AVOID
SUCH DAMAGE IT IS ADVISABLE TO DISCHARGE YOURSELF BY TOUCHING SUCH AS METAL WATER
PIPES OR TAP BEFORE & DURING HANDLING & WORKING ON YOUR CASSETTE.

Remove the 4 screws from the base and separate the two halves of the unit, gently
ease the two connectors on the left out of their sockets.
    The first job is to withdraw the red and white wires, leading to the red/write
head from the larger of the two connectors and replace them reversed. It will be seen
on examination of the connector that the wire inserts are held in place by springy
lugs located in slots at the oppisite end to the wires, by pressing these down with
the end of a small screwdriver and then pulling gently on the wire the insert will
usually come out. Referring to the diagram supplied in the manner reverse the wires
indicated, If for any reason you cannot do this i.e. different type of connector you
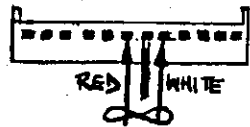can do the equivalent by cutting the tracks on the circuit board and cross wiring
them.
    Next unscrew the circuit board from the base and referring to the diagram cut the
track at H, join the two points together with the wire supplied, and connect the
capacitor to the circuit. Then solder on the 4 wires connecting the RAMBIT interface
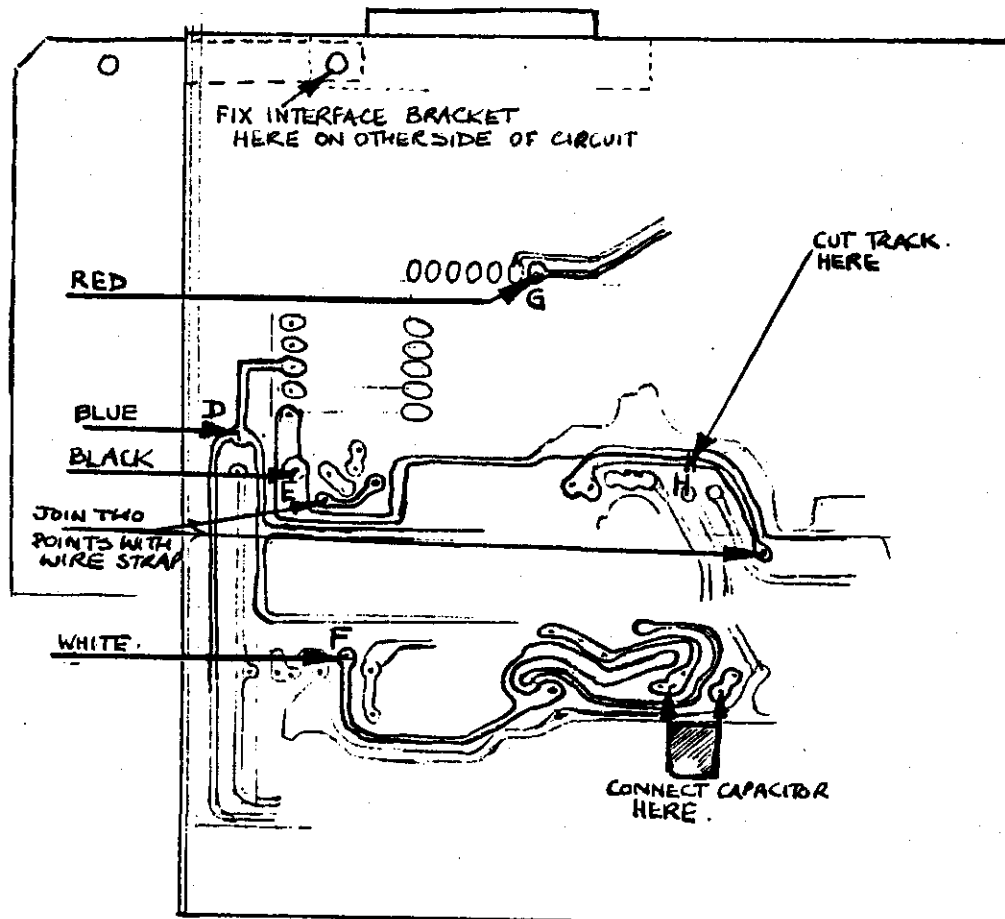blue to D, black to E, white to F and red to G.
    Check the security of leads in the connectors, wire connections, ensure that
there is no solder bridging tracks then fix the board back in the base using the R.H.
socket securing screw to hold the interface clip. Push on the two connectors and
reassemble the unit.
    Your datasette is now ready for testing and should have all its old facilities
plus that of High Speed RAMBIT.

NOTE
This modification is not
necessary on all 1010s
so only carry out if
on testing, fast
loading, recording and
verifying is not
reliable.

MECHANISM TO BOARD
CONNECTOR. WIRE SIDE.

RED | WHITE

WITH DRAW WIRES AND
REVERSE IE WHITE-RED.

FIX INTERFACE BRACKET
HERE ON OTHERSIDE OF CIRCUIT

CUT TRACK.
HERE

RED ..... G

BLUE   D

BLACK

JOIN TWO
POINTS WITH
WIRE STRAP

WHITE . F

CONNECT CAPACITOR
HERE .

Having fitted the interface and reassembled your cassette it is time to test it.
Connect up computer cassette etc, place RAMBIT tape in cassette press PLAY, hold
down START/START & OPTION and switch on ETC as usual. Tape should drive until after
30 seconds approx 'LOADING' plus rapidly changing characters should appear on the
SCREEN followed after 15 seconds by blue screen with'RAMBIT' in top left.
RAMBIT has loaded high speed-you are now ready to use the utility-turn to operating
instructions.
If by some rare misfortune all did not go to plan work through steps below to
attempt a solution.

a) DID TAPE DRIVE?
    YES   NO→TRY FAST FORWARD & REWIND
               O.K. NO-Check belts inside for correct position/touching wires etc.
                     YES-Attempt another load

b) Did you get LOADING?
    YES   NO→Try next copy on tape or otherside-still no,success try one of your (NORMAL LOADING PROBLEM
               regular programs if ok contact us, if not check your work and retry. (WITH RAMBIT OR ALL TAPES)

c) Did you get changing characters ?
    YES   NO→ Check fitting work & retry before contacting us. (PROBLEM WITH HI-SPEED - RED/WHITE CONNECTION
                                                                              TO INTERFACE?
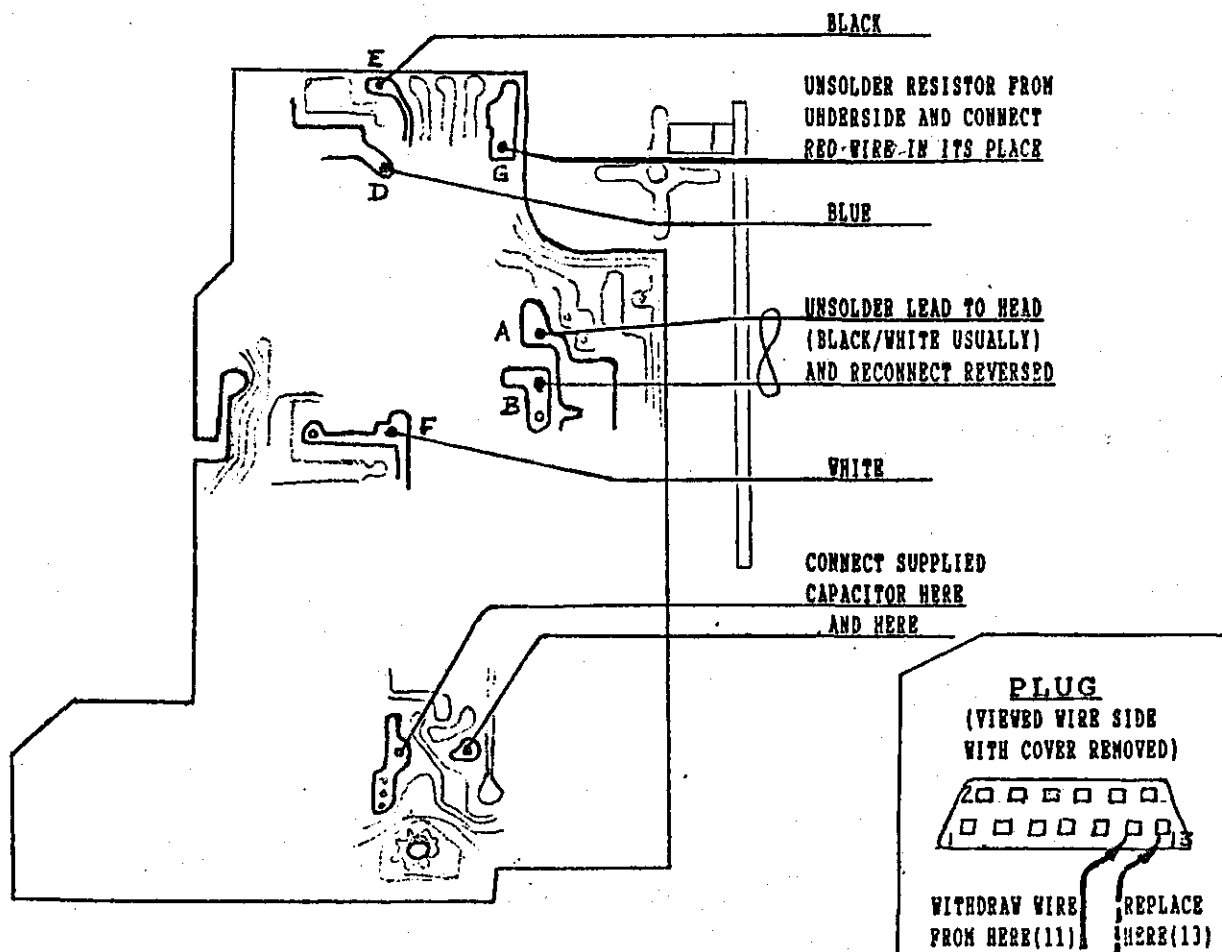   Try other copies of RAMBIT. (2 ON EACH SIDE)
           O.K. NO   interface OK so do checks as operating instructions-if no joy
                      contact us

FITTING RAMBIT TO YOUR XC12 RECORDER.

ELECTRONIC COMPONENTS ARE LIABLE TO BE DAMAGED BY STATIC ELECTRICITY, TO AVOID SUCH DAMAGE WE RECOMMEND THAT YOU DISCHARGE YOURSELF BY TOUCHING A METAL RADIATOR OR SINK TAP BEFORE AND WHILST WORKING ON YOUR TAPE UNIT.
FIRSTLY remove the 4 screws from the base and remove it to reveal the printed circuit board to which the interface has to be connected.
UNFORTUNATELY there are no spare wires in the unit cable so we suggest using the Audio wire as described, otherwise fitting of a larger cable is necessary; this wire has to be moved from position 11 to 13 in the plug (refer to the diagram below right). Remove the plastic plug cover to expose the wires, each is secured in position by a springy metal lug on its connector to be seen in slots in the plug body; by pressing on this lug with the end of a small screwdriver and gently tugging on the relevant wire it can be removed and then slipped into the required new slot where it will lock.
NEXT locate wires labelled A & B checking that they do in fact go to the erase head situated front left of the mechanism unsolder them and reconnect reversed, next unsolder the resistor (or on the earlier version board cut the circuit track with such as a modellers knife) then solder the 4 interface wires and capacitor as in the diagram. Check all your connections for correct location, security or unwanted solder then mount the RAMBIT board by bending its bracket to spring against the star shaped screw boss (or to secure under the fixing plate of the earlier model) then close and refix the cover.

STANDARD XC12 CIRCUIT BOARD.

BLACK

UNSOLDER RESISTOR FROM UNDERSIDE AND CONNECT RED WIRE IN ITS PLACE

BLUE

UNSOLDER LEAD TO HEAD (BLACK/WHITE USUALLY) AND RECONNECT REVERSED

WHITE

CONNECT SUPPLIED CAPACITOR HERE AND HERE

PLUG
(VIEWED WIRE SIDE WITH COVER REMOVED)

WITHDRAW WIRE FROM HERE(11)   REPLACE HERE(13)

HAVING fitted RAMBIT and reassembled your data recorder it is time to test it out. Connect up as usual, place the RAMBIT tape in position, hold pressed START + OPTION and switch on as normal; the tape should feed and after about 30 seconds "LOADING" should be displayed on your screen followed almost immediately by rapidly changing coloured characters. Shortly the screen should clear and "RAMBIT" appear in the top left corner, you are now ready to attempt some Hi-Speed recording etc.
IF all did not go according to plan work through the following steps:-

A) DID TAPE DRIVE?..NO→TRY FAST FORWARD & REWIND.
   YES   O.K?..YES RETRY LOADING VARIOUS TAPES.
    ↓   NO..CHECK LEADS, BELTS ETC.

B) DID "LOADING" DISPLAY?..NO→TRY NEXT COPY OF RAMBIT O.K? NO TRY REGULAR SOFTWARE
   YES   O.K? NO RECHECK YOUR WORK.
    ↓   YES CONTACT us FOR ADVICE.

C) DID YOU GET CHANGING CHAR'S? NO→RECHECK YOUR WORK AND RETRY.
   YES
    ↓
TRY OTHER COPY OF RAMBIT.
IF YOU DO NOT GET SATISFACTORY LOADING & RECORDING DO NOT HESITATE TO ASK FOR ADVICE!

RAMBIT