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**SYNCHRONIZER  
INTERFACE  
INFORMATION**

**FOR**

**MX AND MTR SERIES  
MACHINES**

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EDITION 1  
MAY 1985



MX 5050 BQII & MK III SERIES

Conditions For Synchronizer Use

1. All transport tallies are low true.
2. Synchronizer must read tach pulses in fast wind as machines won't read time code at high speeds without circuit modifications. Also, tape lifters would need to be defeated in all modes which is not suggested by Otari.
3. Synchronizer must be able to control capstan speed by varying a DC voltage. This voltage is  $\pm 13v$  on machines with locator connectors and  $\pm 3v$  on machines without locator connectors.
4. Synchronizer must supply dry contacts for speed bypass during non-synchronizer use to provide calibrated speed. If cable is removed while in EXT capstan control, the machine will not operate at calibrated speed unless a dummy plug is installed.

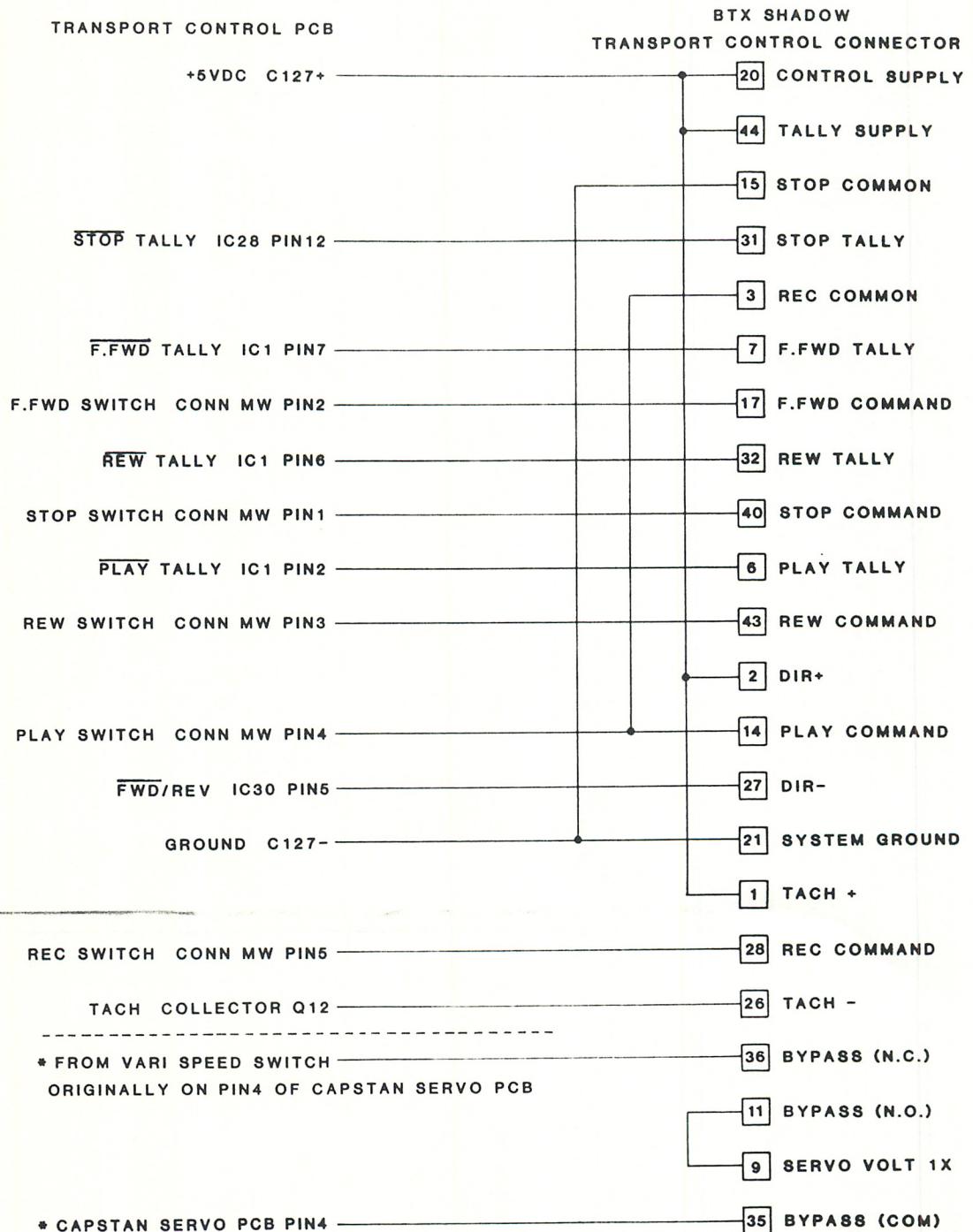
Note:

On machines with locator connectors, the choice of internal or external capstan control is located on the control PCB. When switched to EXT., the pitch control will not function even though the LED will light when the pitch knob is pulled on.



# MX-5050 MK III SERIES TO BTX SHADOW

MACHINES WITH NO LOCATOR CONNECTOR INCLUDING BQ-II



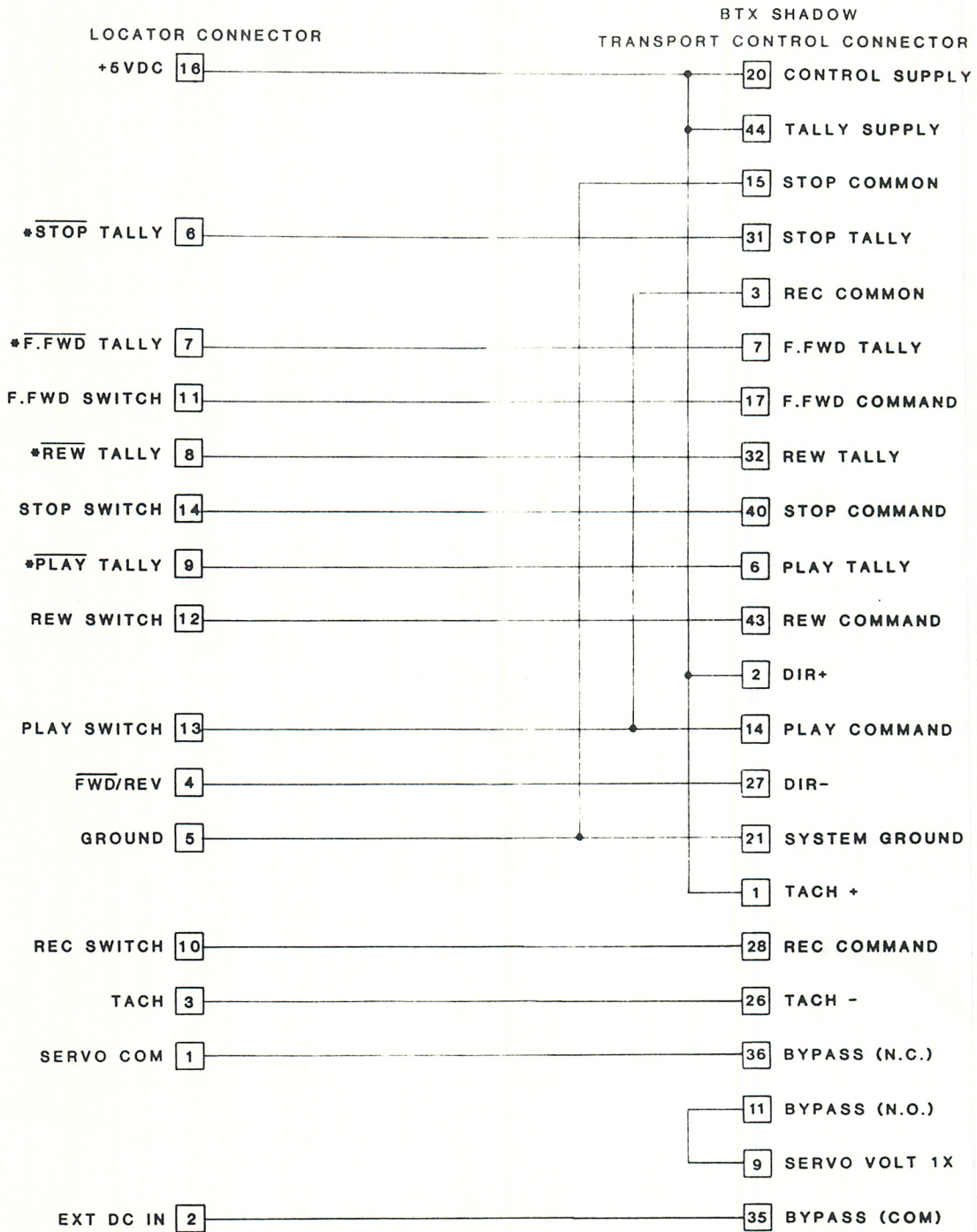
### NOTES:

1. TO IMPROVE CAPSTAN LOCK-UP PERFORMANCE, JUMPER R34 (1K) WITH A 100 OHM 1/4WATT RESISTOR ON THE MOTHER PCB OF THE SHADOW MAINFRAME
- \* 2. WITH NO SYNCHRONIZER CONNECTED, JUMPER THESE POINTS FOR NORMAL CAPSTAN SPEED



# MX-5050 MK III SERIES TO BTX SHADOW

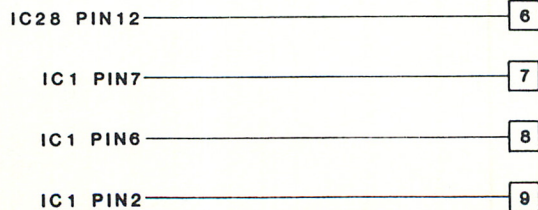
MACHINES WITH 16 PIN LOCATOR CONNECTOR INCLUDING BQ-II



### TRANSPORT CONTROL PCB

### LOCATOR CONNECTOR

PIN NO.

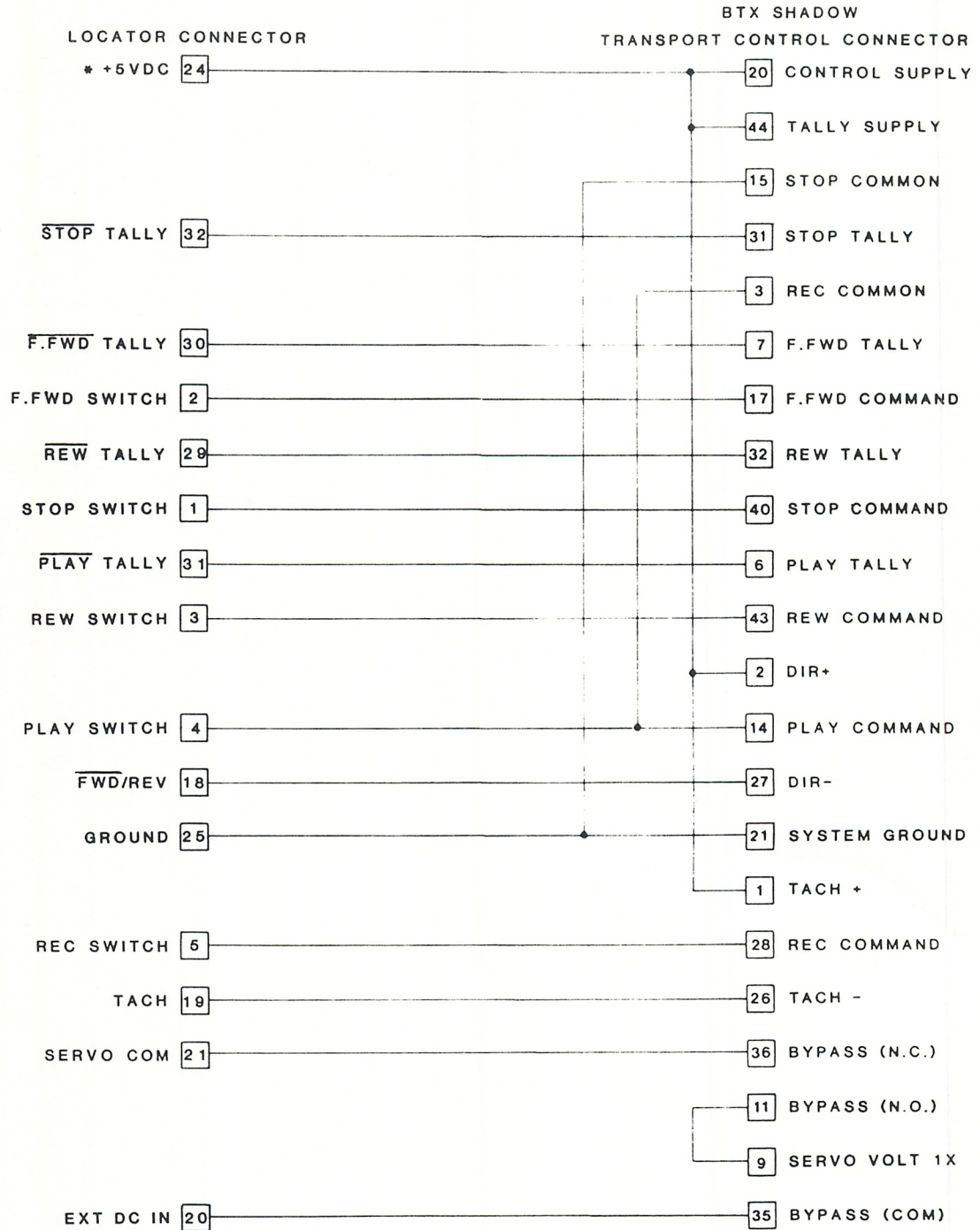


\* REMOVE AND INSULATE THE EXISTING WIRES TO THESE PINS  
 ADD NEW WIRES TO PINS 6, 7, 8, 9  
 AS SHOWN



# MX-5050 MK III SERIES TO BTX SHADOW

MACHINES HAVING 34 PIN LOCATOR CONNECTOR



\* EARLY MACHINES WITH 34 PIN CONNECTORS DID NOT HAVE +5VDC ON PIN 24  
ADD A WIRE FROM PIN 24 TO CONTROL PCB CONNECTOR MK PIN 2



MX 70 SERIES

Conditions For Synchronizer Use

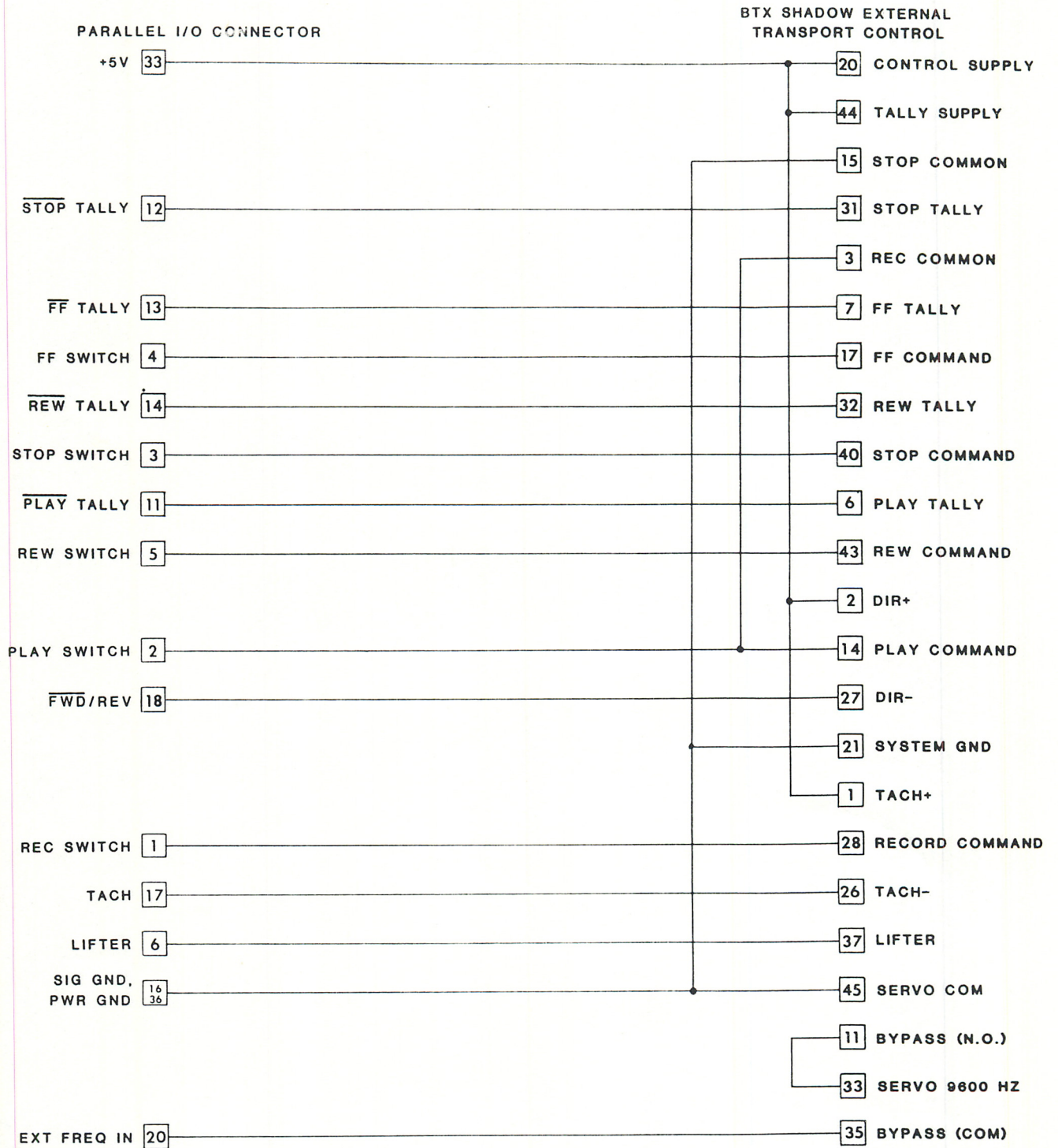
1. All transport tallies are low true.
2. Speed switch on remote to EXT. position.
3. All connections for synchronizer are available on 37 pin 'D' connector labeled, "PARALLEL I/O." See cable schematic.

Note:

For code reading during fast wind, installation of ZA-571 wide band reproduce assy. is recommended. Contact factory for details.



# MX-70 TO BTX SHADOW





MTR 10 1/12 1 SERIES

Conditions For Synchronizer Use

1. All transport tallies are high true and can easily be converted to low true if necessary.
  - A. To invert tallies on a machine where no remote or auto locator is being used, replace IC 20 on transport control PCB with an SN7406N.
  - B. To invert tallies on a machine where a remote or auto locator is being used, installation of a ZA-53F tally interface assy. is necessary.
2. Do not pull lifter defeat (cue) line down except in fast wind modes to avoid attenuated audio. If synchronizer must do this, contact factory for modifications to transport control PCB.
3. RC time constant shown in cable schematic must be used to prevent accidental enabling of back play mode.
4. Speed mode switch on machine to be set to EXT. for synchronizer use. For normal calibrated speed, return switch to FIX position.
5. If using at 30ips for synchronizer application, jumper across C40 on capstan control PCB.
6. Verify value of R22 on capstan control PCB is 680 $\Omega$ . If not, install it.

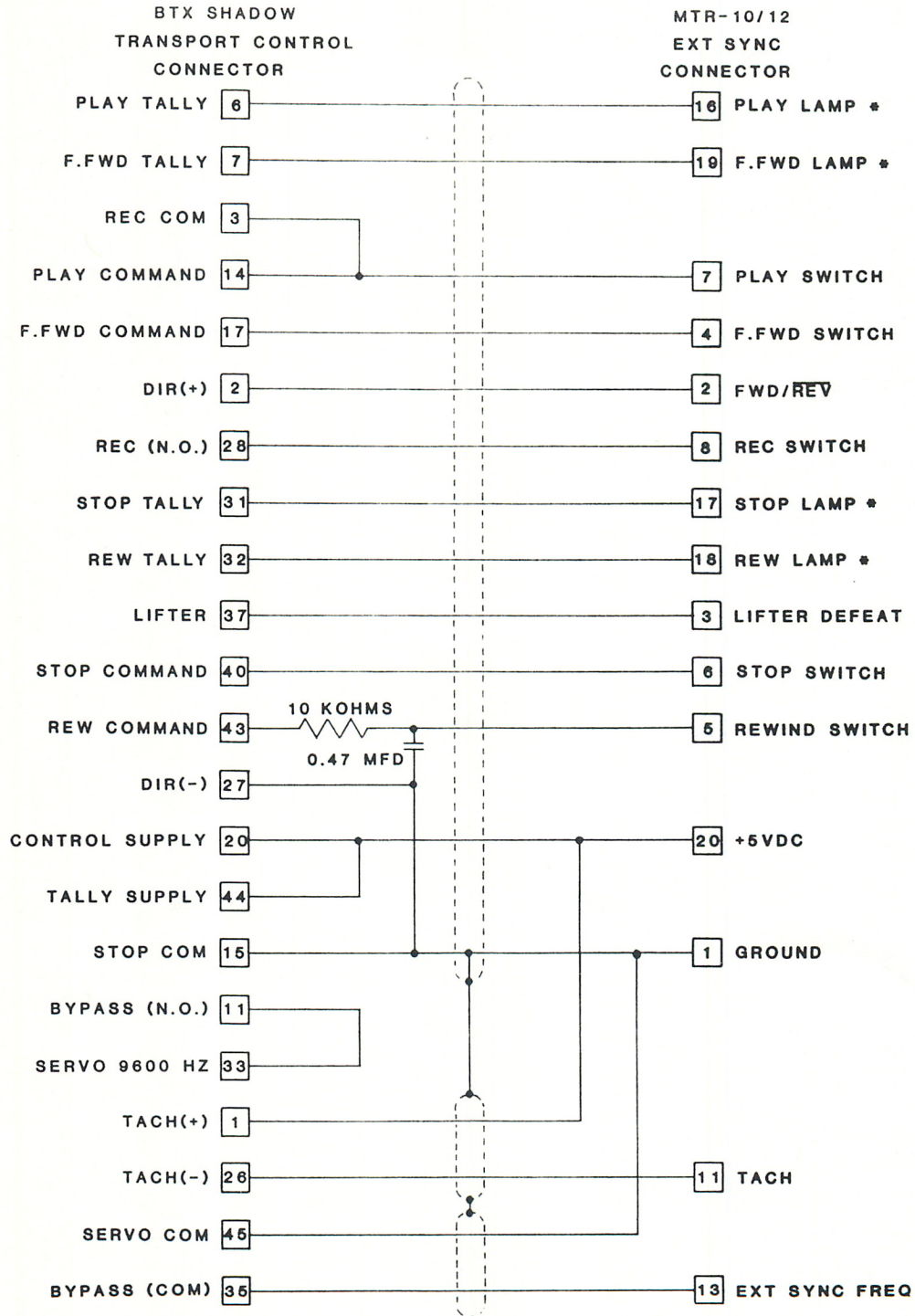
Note:

All connections for synchronizer use are available on 20 pin HONDA connector labeled, "EXT. SYNC."  
See cable schematic.





# MTR-10I/12I TO BTX SHADOW



\* TALLIES ARE HIGH TRUE FROM FACTORY  
FOR LOW TRUE TALLIES, SEE ITEM 1 ON CONDITIONS SHEET



## MTR 10II/12II SERIES

### Conditions For Synchronizer Use

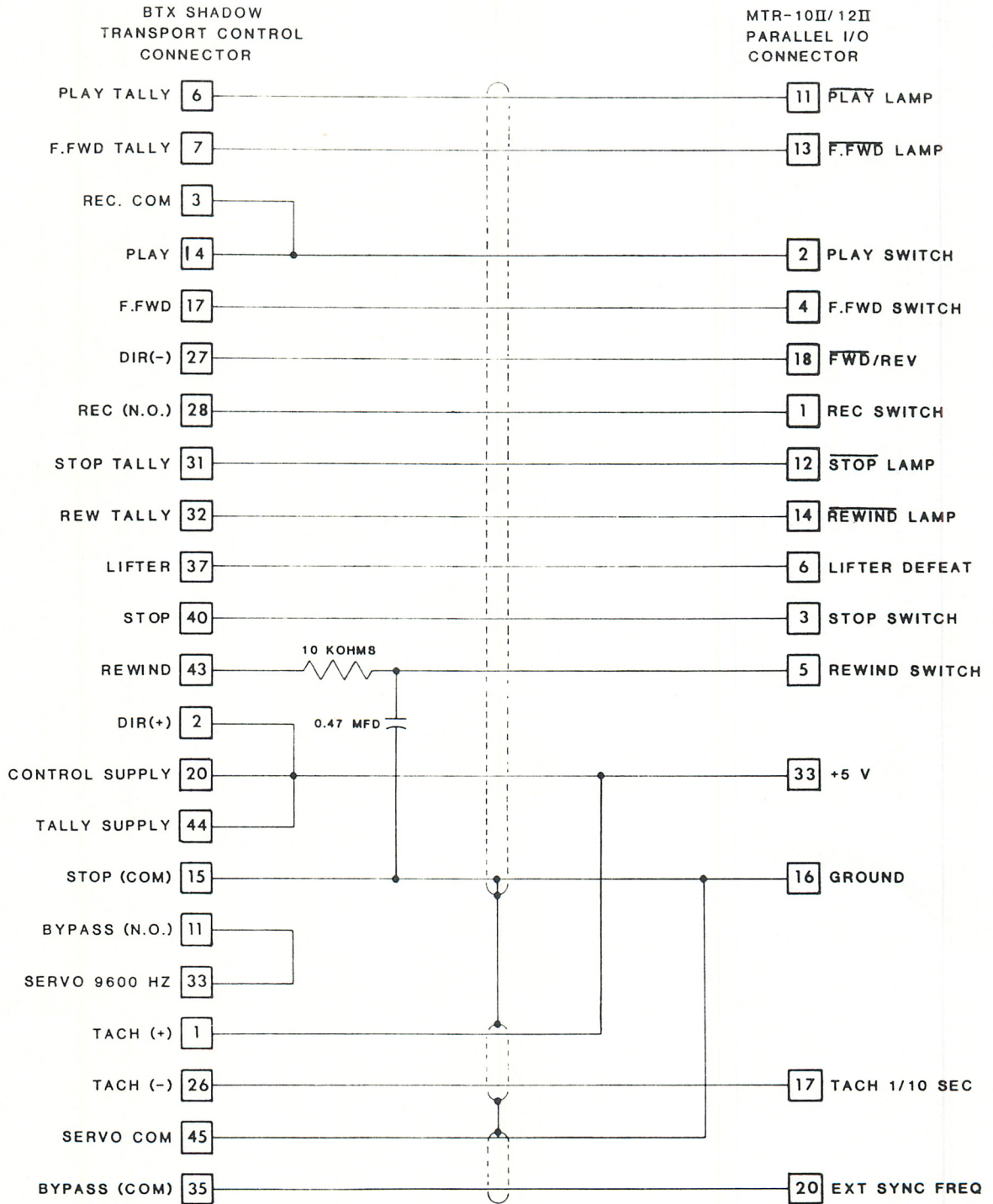
1. All transport tallies are low true.
2. Do not pull lifter defeat (cue) line down except in fast modes to avoid attenuated audio. If synchronizer must do this, contact factory for modifications to the transport control PCB.
3. RC time constant shown in cable schematic must be used to prevent accidental back play mode.
4. Speed mode on machine to be set to EXT. for synchronizer use. For normal calibrated speed, return switch to FIX position.
5. If using at 30ips for synchronizer use, jumper C40 on capstan control PCB.
6. Verify that R22 on capstan control PCB is 680 $\Omega$ . If not, install it.

#### Note:

All connections for synchronizer use are available on 37 pin 'D' connector, labeled "PARALLEL I/O." See cable schematic.



# MTR-10II/12II TO BTX SHADOW





## MTR-10/12 WIDE BAND

Modification of Audio Channel for Dedicated Wide Band use.

1. Turn Off the Power to the MTR-10/12 and remove the audio channel PCB from the channel to be used for Time Code, or modify a spare PCB.

Modification for 1/4" - 2 Track Machines

2. Connect a 3 kOhm resistor across R1.
3. Connect a 30 Ohm resistor across R11.

Modification for 1/2" - 4 Track machines

2. Connect a 4.7 kOhm resistor across R1.
3. Connect a 150 Ohm resistor across R11.

Perform the steps below for all machines

4. On the upper (Comp) side of the PCB, cut the trace that leads to Pin 16 of the edge connector. This defeats the play-to-stop and fast wind muting.
5. On the lower (Dip) side of the PCB, cut the trace that leads to Pin 21 of the edge connector. On the upper (comp) side of the PCB, install a 100 kOhm 1/4 watt resistor from the junction of R 59 and R 60 (close to VR9 in the center of the PCB) to the solder feed-through located between the +20 and -20 V test points located immediately below the resistors. This defeats the audio attenuation in Stop, Cue Shuttle, and Lifter Defeat modes.

NOTE: This modification provides good quality, non-phase-compensated code output. If your synchronizer requires better quality code than this modification provides, installation of a WBR-1 Wide Band Kit on one of your Audio PCBs may be required. Please contact OTARI for further details.



## MTR 90I SERIES

### Conditions For Synchronizer Use

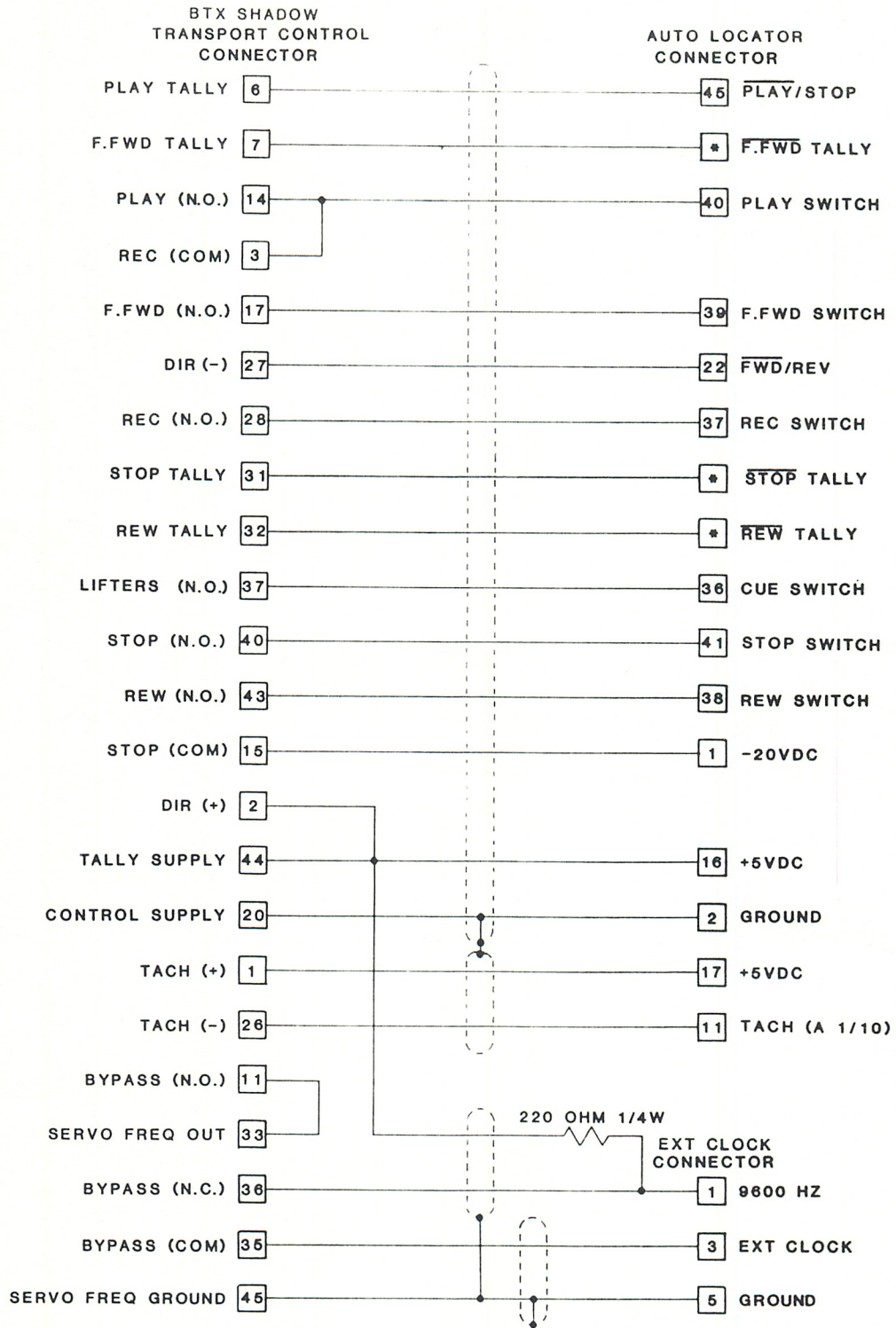
1. All transport tallies are low true
2. Speed mode on transport in EXT. position.
3. If synchronizer pulls cue line down in stop, center the cue slider potentiometer to avoid tape crawl.
4. 9 pin EXT. CLOCK 'D' connector is used for incoming and outgoing 9600Hz (see cable schematic).
5. 50 pin AUTO LOCATOR 'D' connector contains tach, direction and transport command lines (see cable schematic).
6. Tallies are available from lamp power resistors located on transport control mother board #2 which is located inside left of lower rear panel. Use clipleads or EZ hooks (see tally drawing).

#### Note:

Since tally lines are derived from low side of button lamps, it is suggested to individually add 100K pull up resistors from the +20V line (pin 33) to tally lines to prevent loss of tally information in the event of a lamp burning out.

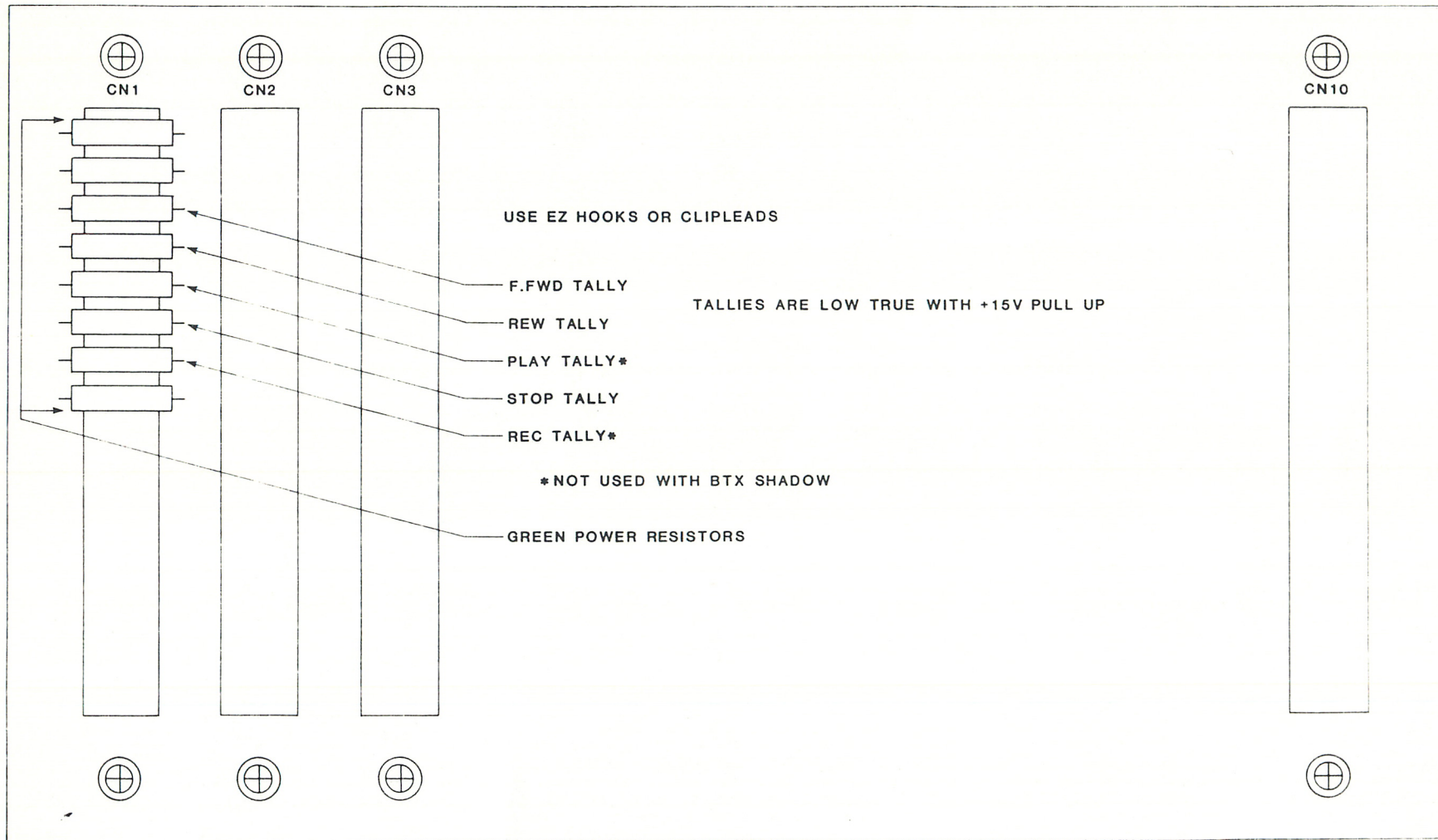


# MTR-90 I TO BTX SHADOW



\* TALLIES ARE NOT PRESENT ON THE CONNECTOR  
USE CLIP LEADS TO LAMP RESISTORS ON  
TRANSPORT CONTROL MOTHER PCB

**MTR-90 I TALLIES**



TRANSPORT CONTROL MOTHER PCB<sup>4</sup>  
LOCATED INSIDE LEFT SIDE OF LOWER REAR PANEL



## MTR-90 I WIDE BAND

Modification of Audio Channel for Dedicated Wide Band use.

1. Turn Off the Power to the MTR-90 I and remove the audio channel PCB from the channel to be used for Time Code, or modify a spare PCB.
2. Install a 10K ohm resistor across R 101.
3. Install a 10K ohm resistor across R 176.
4. Cut the trace leading to pins 28 A & B of the edge connector (This defeats the Stop-to-Play Mute for this channel).
5. Cut the trace between the edge connector finger for pin 14 A & B and the adjacent feedthrough. Connect a 10 kOhm resistor from this feedthrough to pin 32 A & B. (This connection defeats the Fast-Wind mute for this channel).

NOTE: This modification provides good quality, non-phase-compensated code output. If your synchronizer requires better quality code than this modification provides, installation of a WBR-1 Wide Band Kit on one of your Audio PCBs may be required. Please contact OTARI for further details.





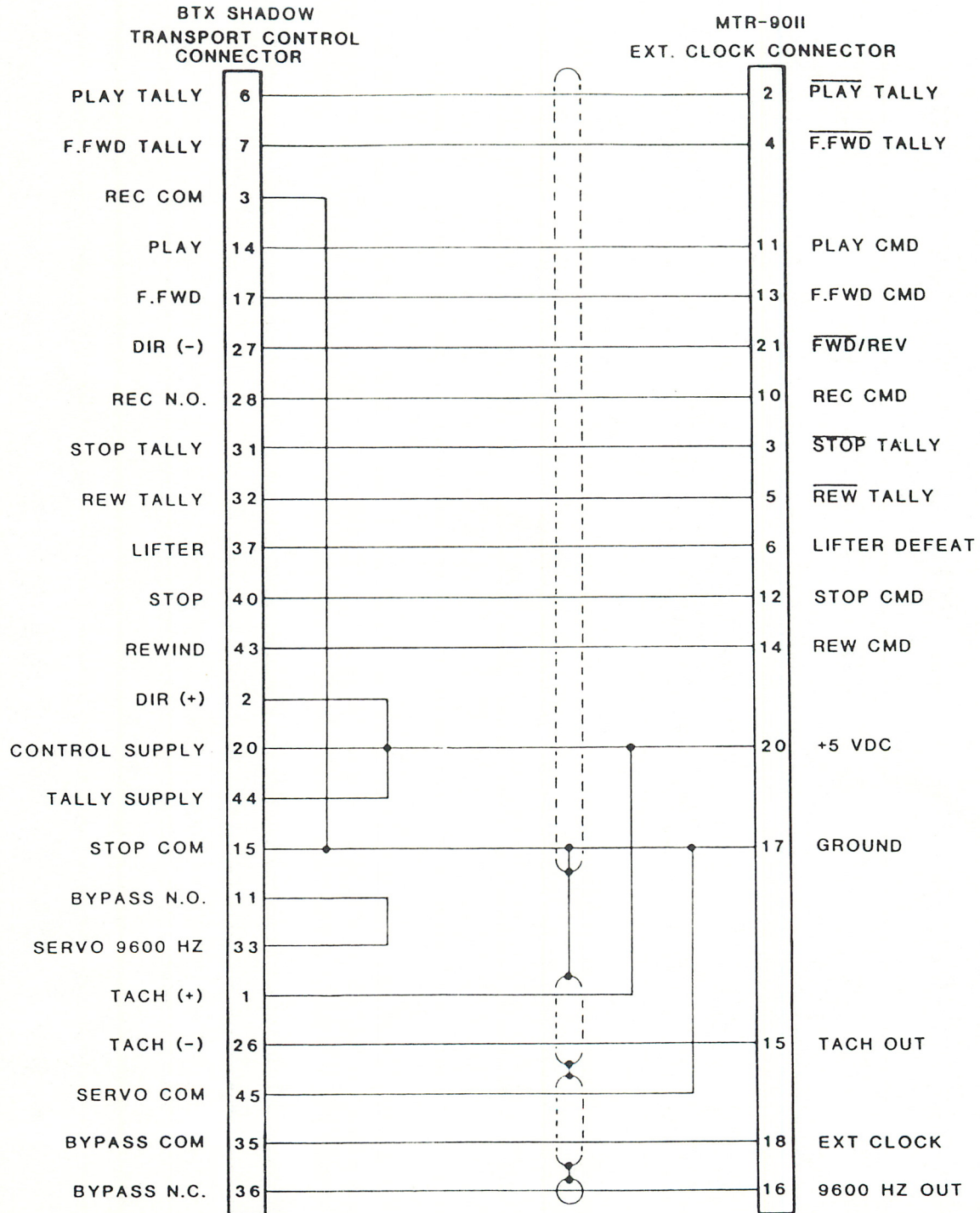
MTR 90 II SERIES

Conditions For Synchronizer Use

1. All transport tallies are low true.
2. Speed mode switch on remote in EXT. position.
3. All connections for synchronizer use are available on 25 pin Honda connector labeled, "EXT CLOCK." See cable schematic.



# MTR-90 II TO BTX SHADOW





## MTR-90 II WIDE BAND

Modification of an Audio Channel for Dedicated Wide Band Use

1. Turn Off the Power to the MTR-90 II and remove the audio channel PCB from the channel to be used for Time Code, or modify a spare PCB.
2. Install a 10K ohm resistor across R 101.
3. Install a 10K ohm resistor across R 125.
4. Connect a wire from Pin 6 of IC 510 to Pin 14 of IC 510. (This connection defeats the Stop-to-Play Mute for this channel).
5. Connect a wire from the cathode (banded end) of D 535 to IC 103 Pin 8. (This connection defeats the Fast-Wind mute for this channel).

NOTE: This modification provides good quality, non-phase-compensated code output. If your synchronizer requires better quality code than this modification provides, installation of a WBR-1 Wide Band Kit on one of your Audio PCBs may be required. Please contact OTARI for further details.



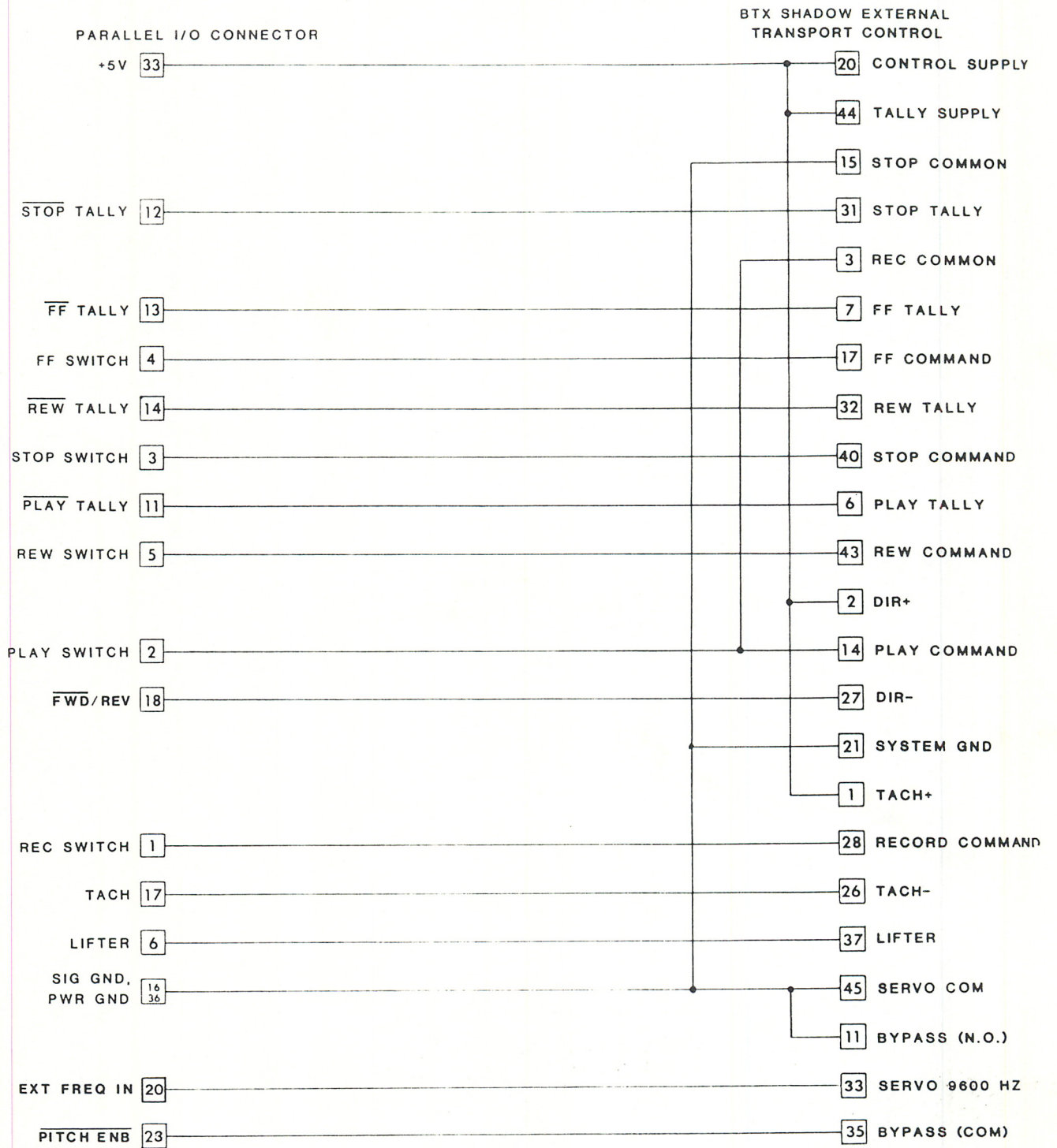
## MTR 20 SERIES

### Conditions For Synchronizer Use

1. All transport tallies are low true.
2. Speed switch on machine to EXT. 1 or EXT. 2 (depending on options).
3. All connections for synchronizer use are available on 37 pin 'D' connector labeled, "PARALLEL I/O." See cable schematic.



# MTR-20 TO BTX SHADOW





## MTR-20 Q WIDE BAND

MODIFICATION OF AUDIO CHANNEL FOR DEDICATED WIDE BAND TIME CODE  
FOR MTR-20 Q

1. Turn off the power to the MTR-20 and remove the Audio Channel Module from the channel to be used for Time Code, or modify a spare module.
2. Remove the 4.7 kOhm resistor from the L5 position on the PCB, and replace with a 100 kOhm 1/4 Watt resistor.
3. Replace or bridge R114 with a 3.3 kOhm 1/4 Watt resistor.
4. Replace or bridge R121 with a 100 Ohm 1/4 Watt resistor.
5. Adjust SYNC GAIN and the REPRO GAIN trimmer for the appropriate speed for 0 VU in Play mode, using a pre-stripped Time Code tape, or a Standard Reproduce Alignment tape at 1 kHz.

Do not adjust the H.F. Equalization for the Time Code Channel.

NOTE: DO NOT AUTO-ALIGN THE TIME CODE CHANNEL. Perform Record Alignment on the Time Code Channel manually. You can Auto-Align the remaining Audio channels by using the "Partial Auto-Alignment" procedure described in the MTR-20 Operating Instructions.

This modification provides good quality, non-phase-compensated code output. If your synchronizer requires better quality code than this modification provides, contact OTARI for further assistance.