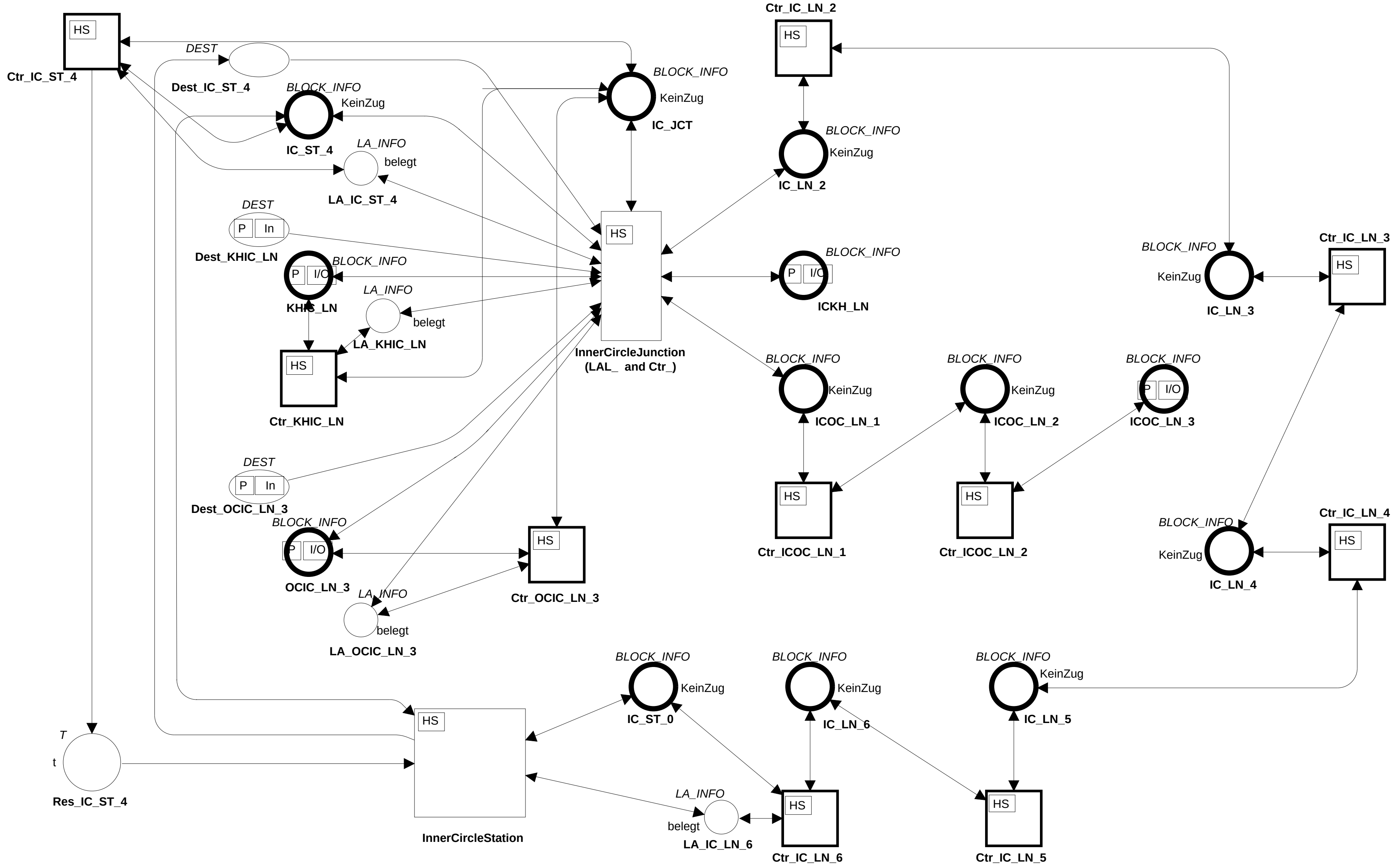
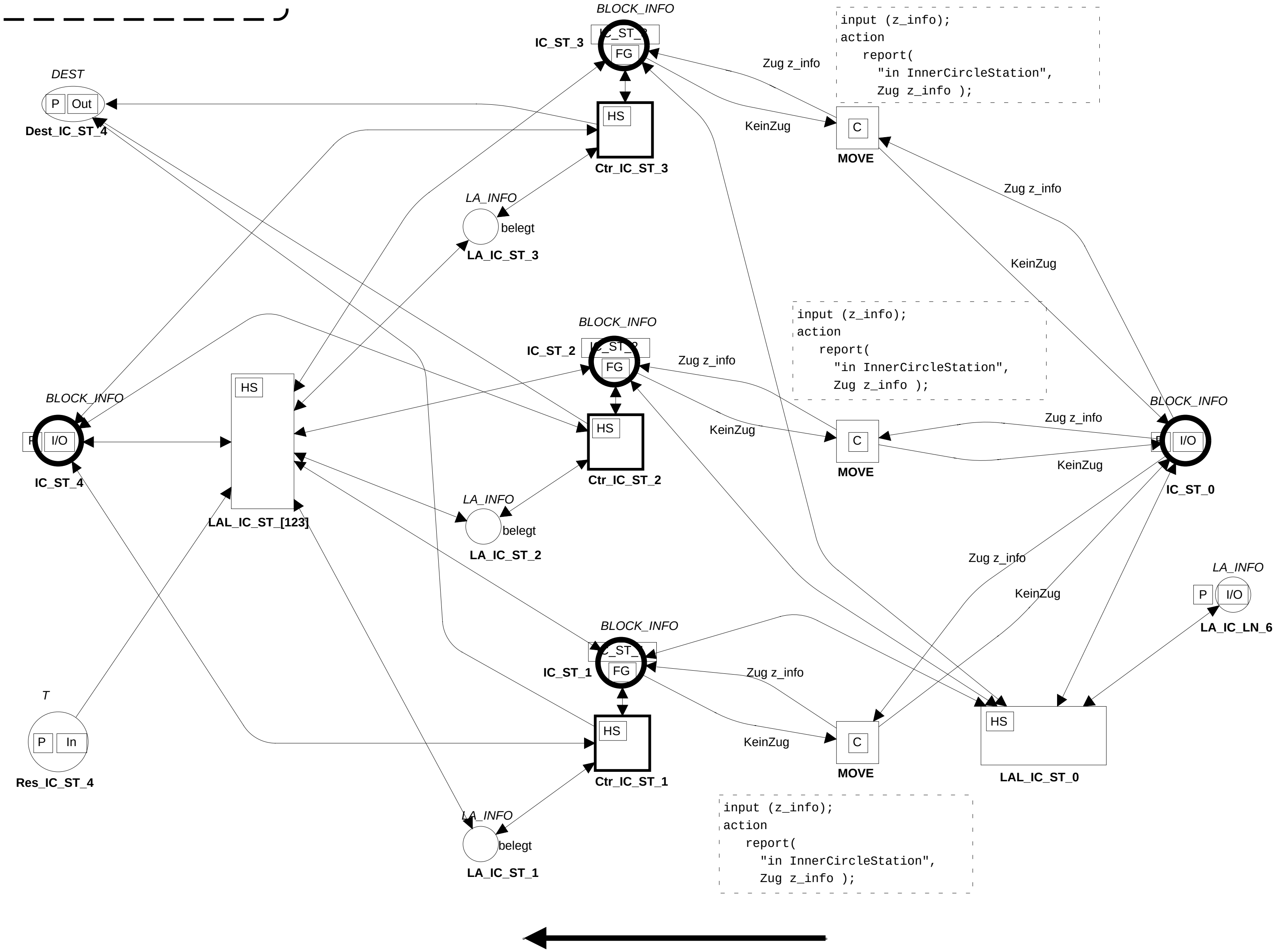
‘‘InnerCircle’’

Seite 7 Datum: Jan-26-1998



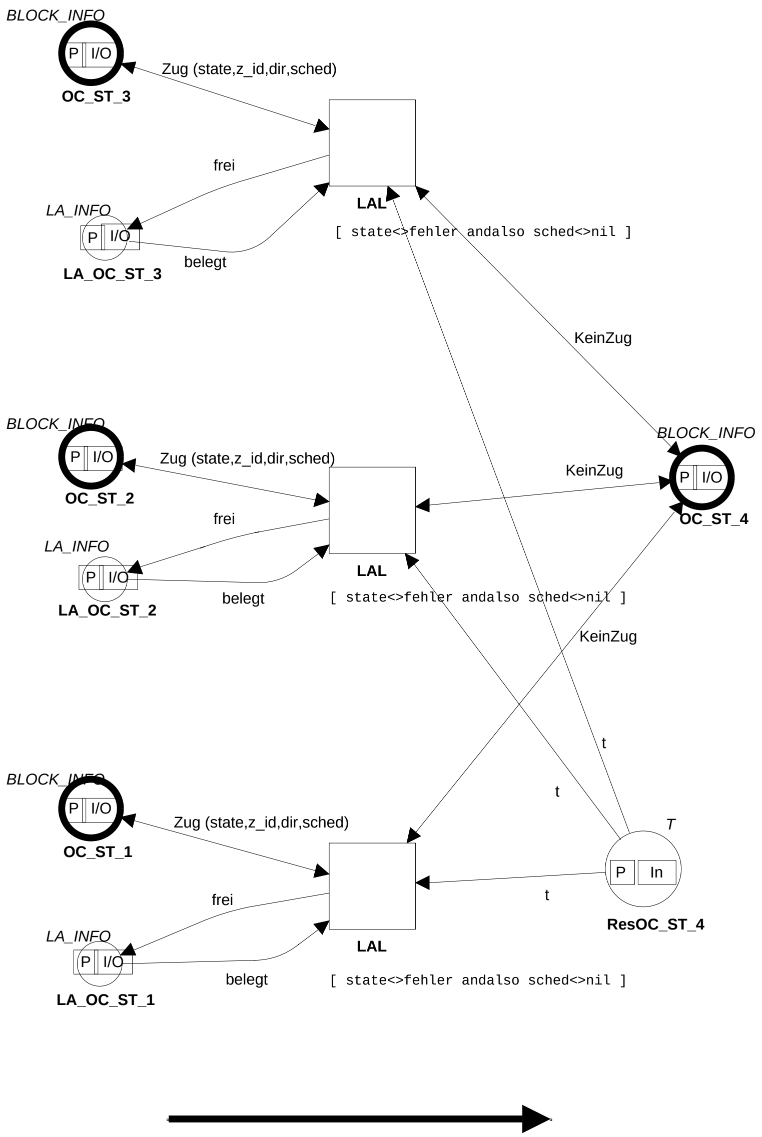
‘‘IC_Station’’

Seite 1 **Datum: Jan-26-1998**



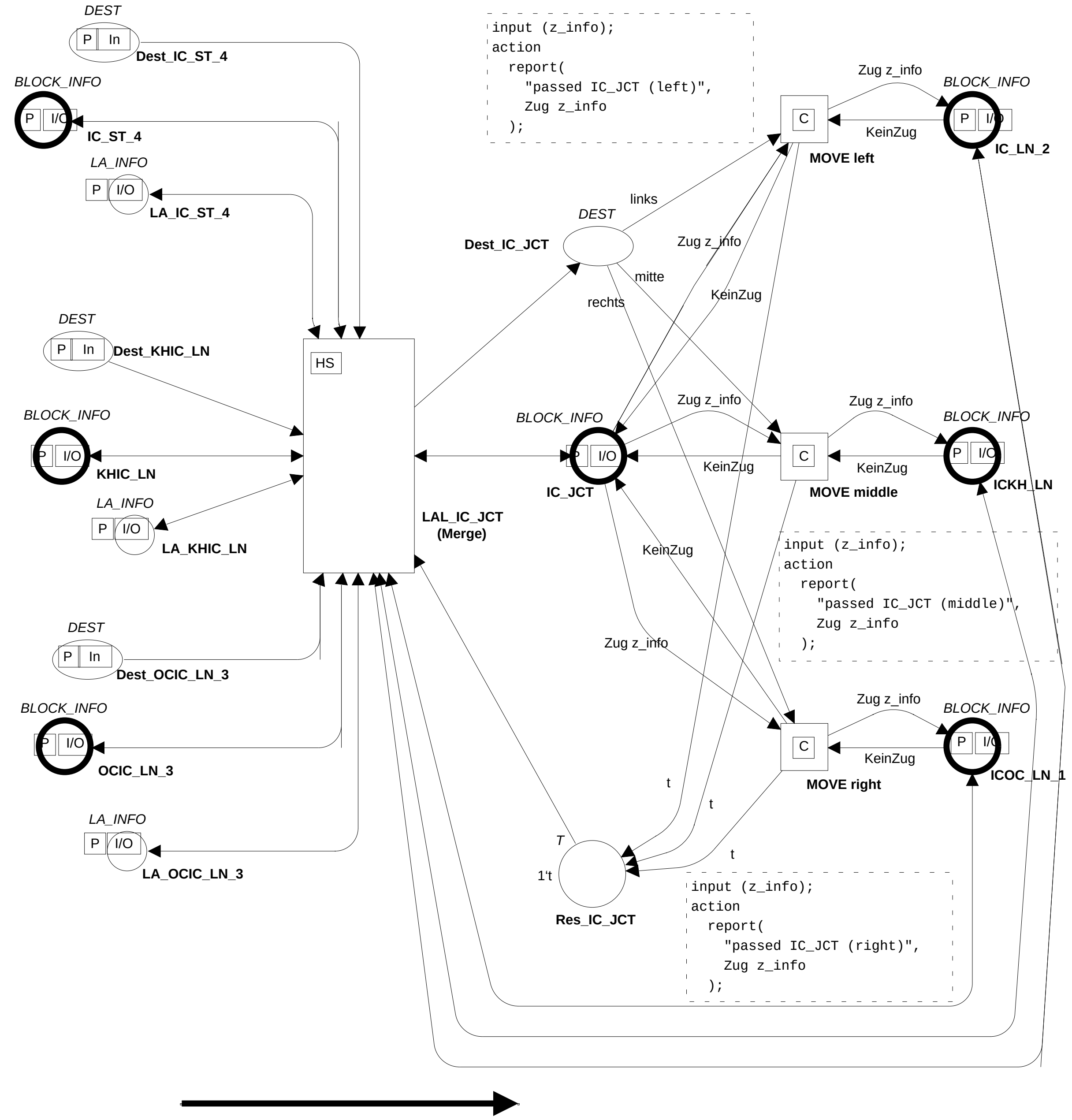
‘‘LAL_3_Merge’’

Seite 4 Datum: Jan-26-1998



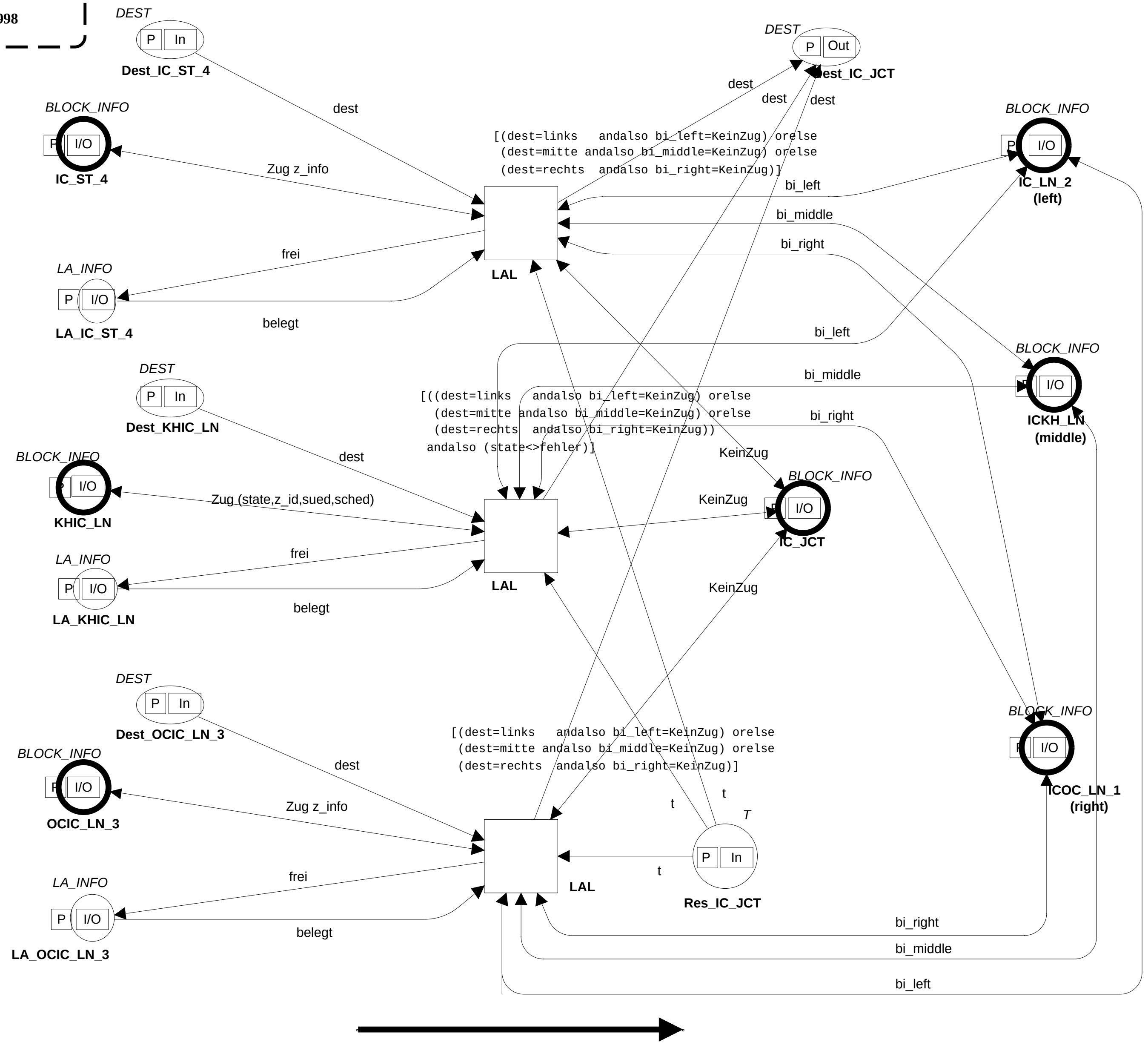
‘‘InnerCircleJunction’’

Seite 6 **Datum: Jan-26-1998**



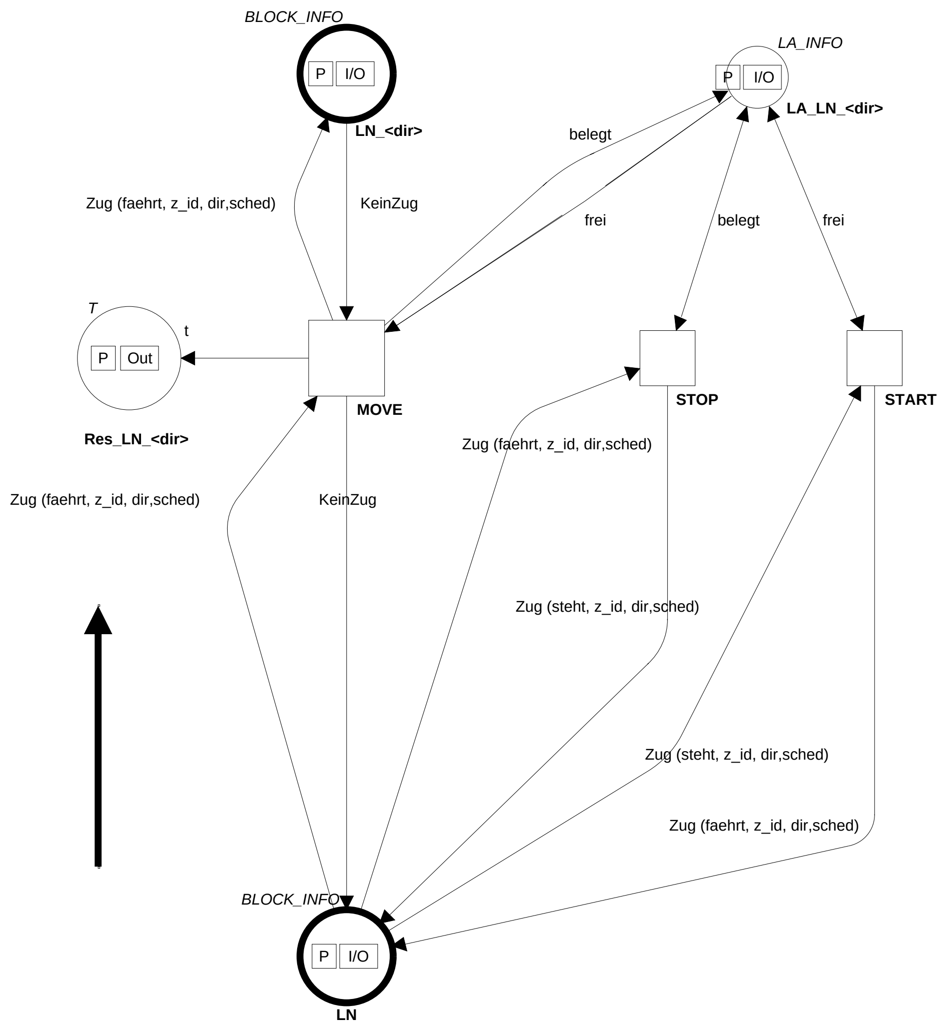
‘‘LAL_IC_JCT’’

Seite 11 **Datum: Jan-26-1998**



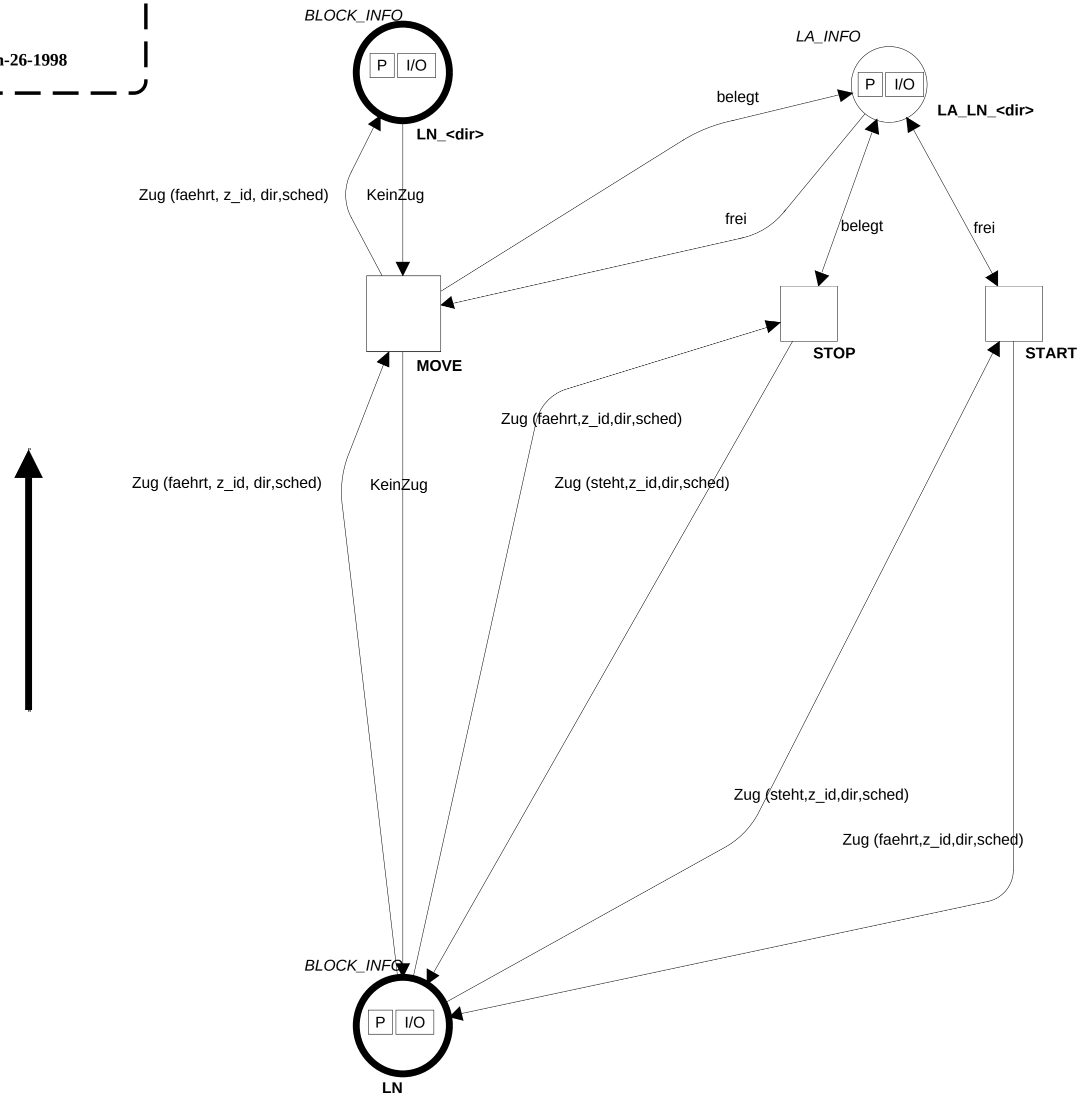
‘‘BS_LA_ns_Rns’’

Seite 10 **Datum: Jan-26-1998**



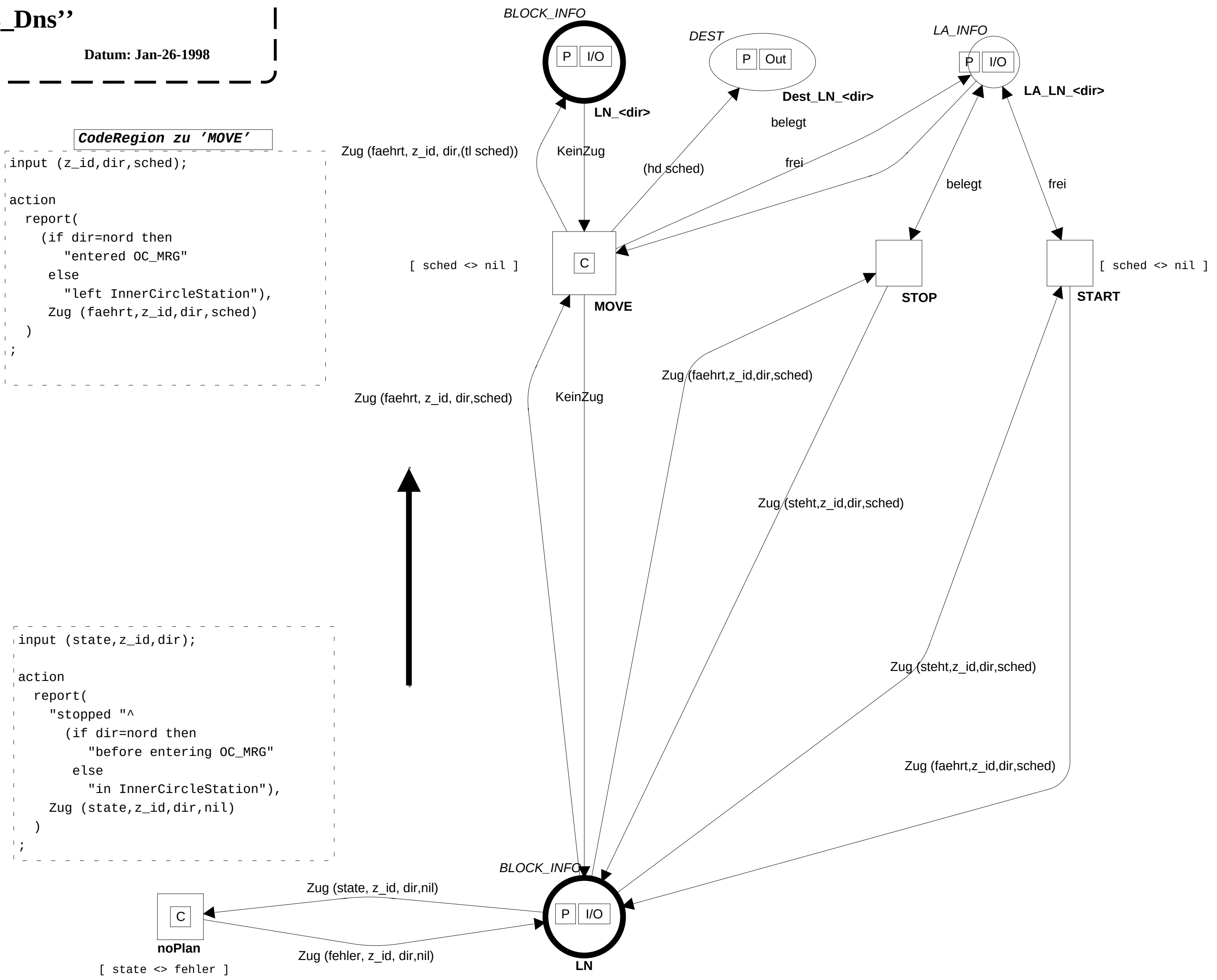
‘‘BS_LA_ns’’

Seite 5 **Datum: Jan-26-1998**



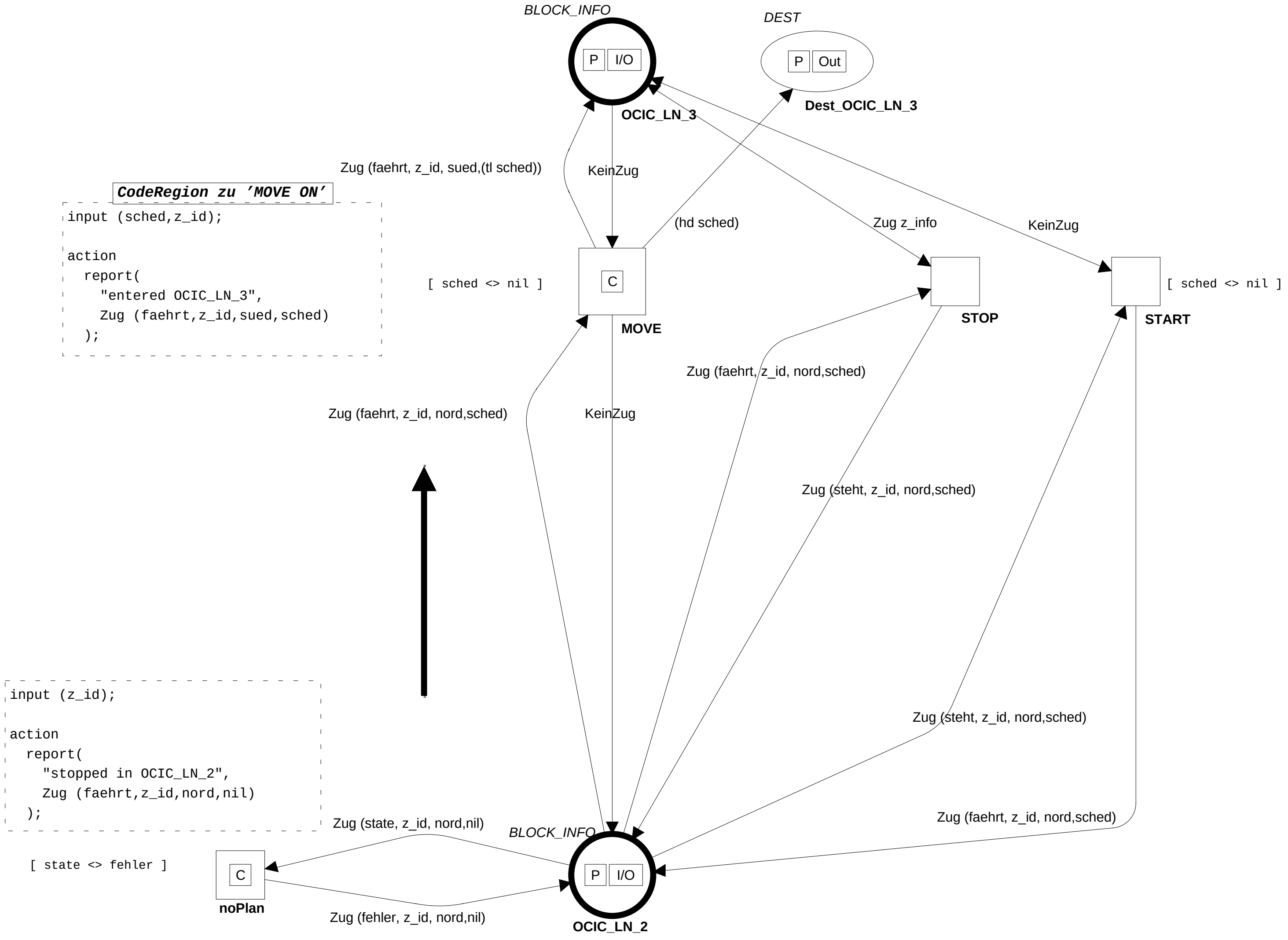
‘‘BS_LA_ns_Dns’’

Seite 12 **Datum: Jan-26-1998**



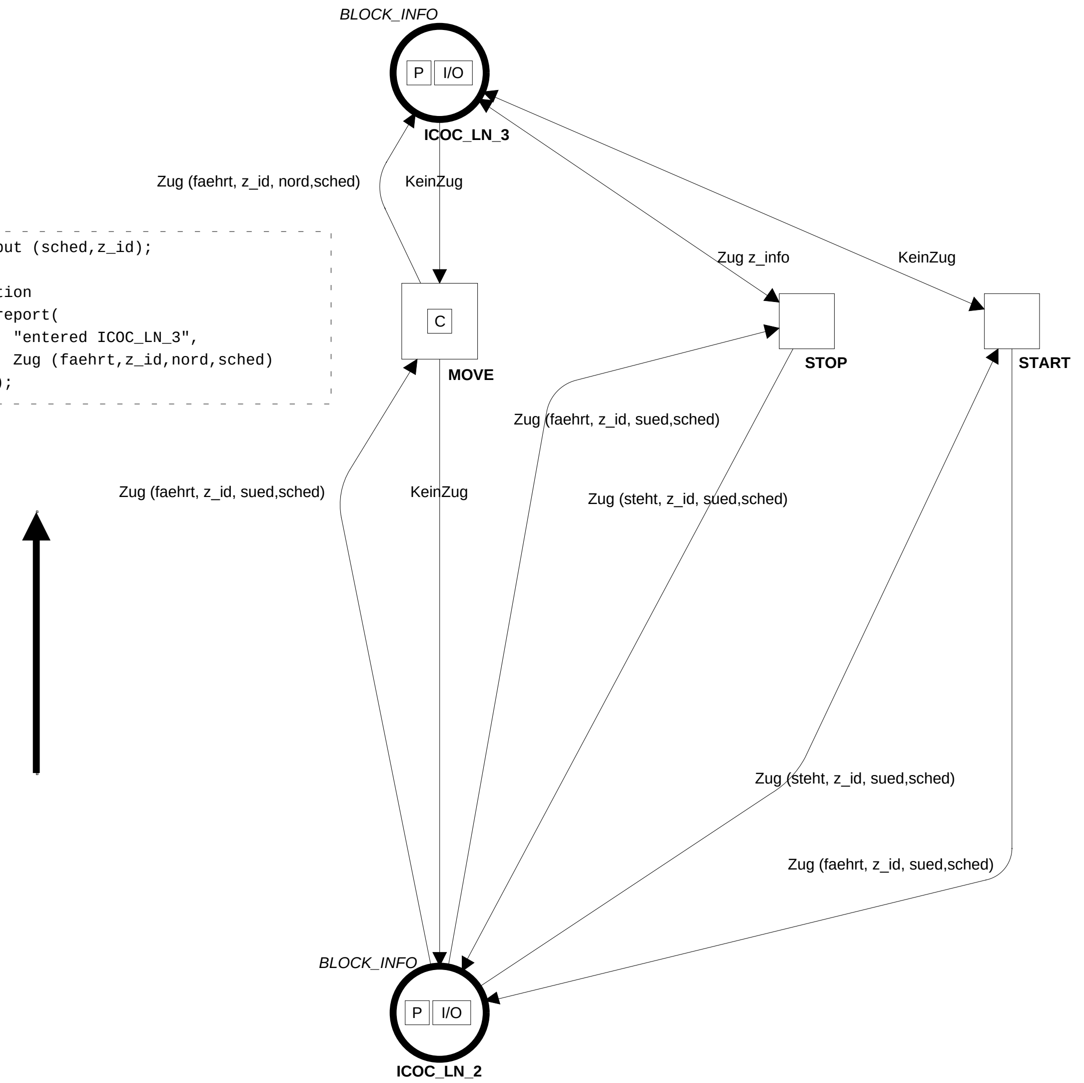
‘‘Ctr_OCIC_LN_2’’

Seite 15 **Datum: Jan-26-1998**



‘‘Ctr_ICOC_LN_2’’

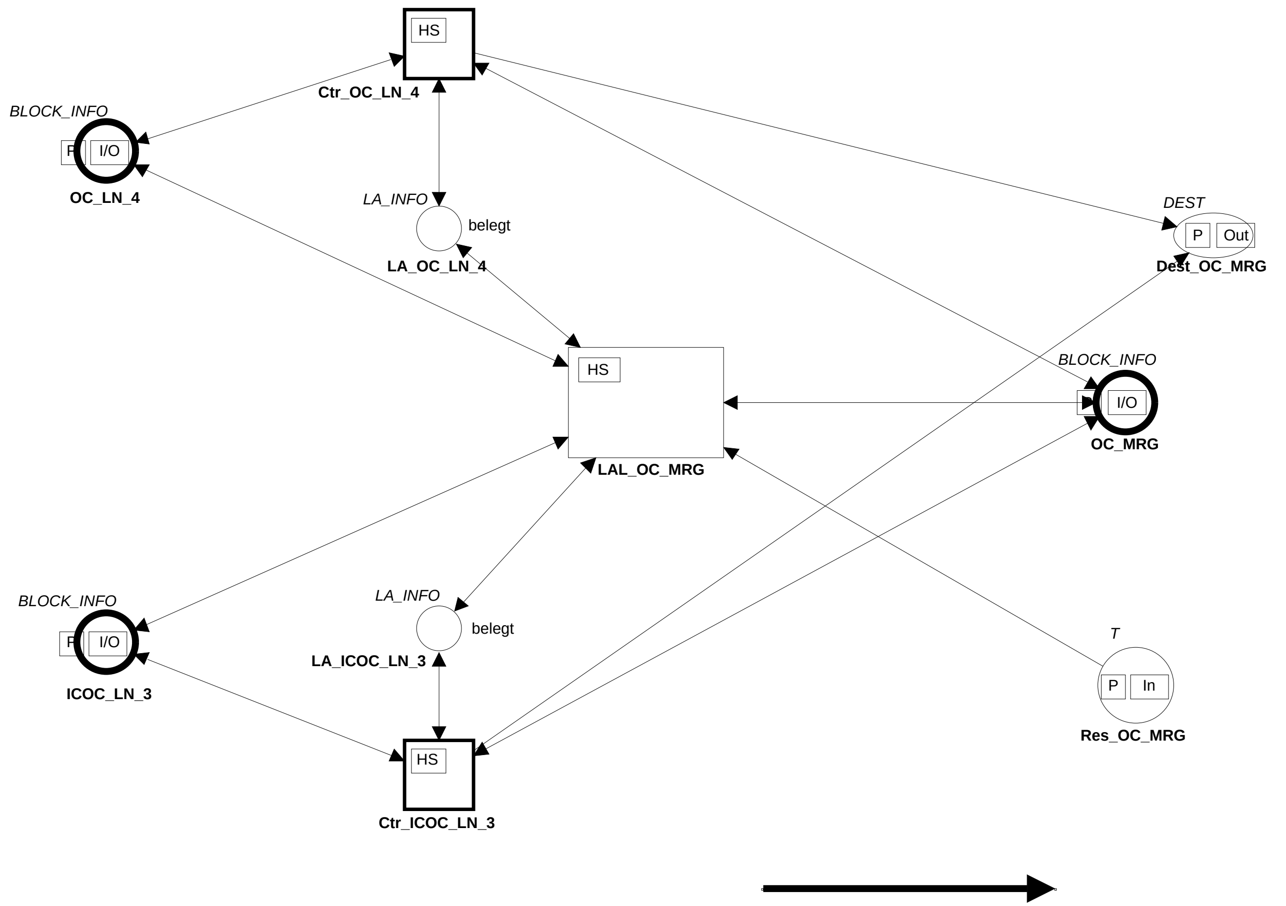
Seite 17 **Datum: Jan-26-1998**




```
input (sched,z_id);

action
  report(
    "entered ICOC_LN_3",
    Zug (faehrt,z_id,nord,sched)
  );
```

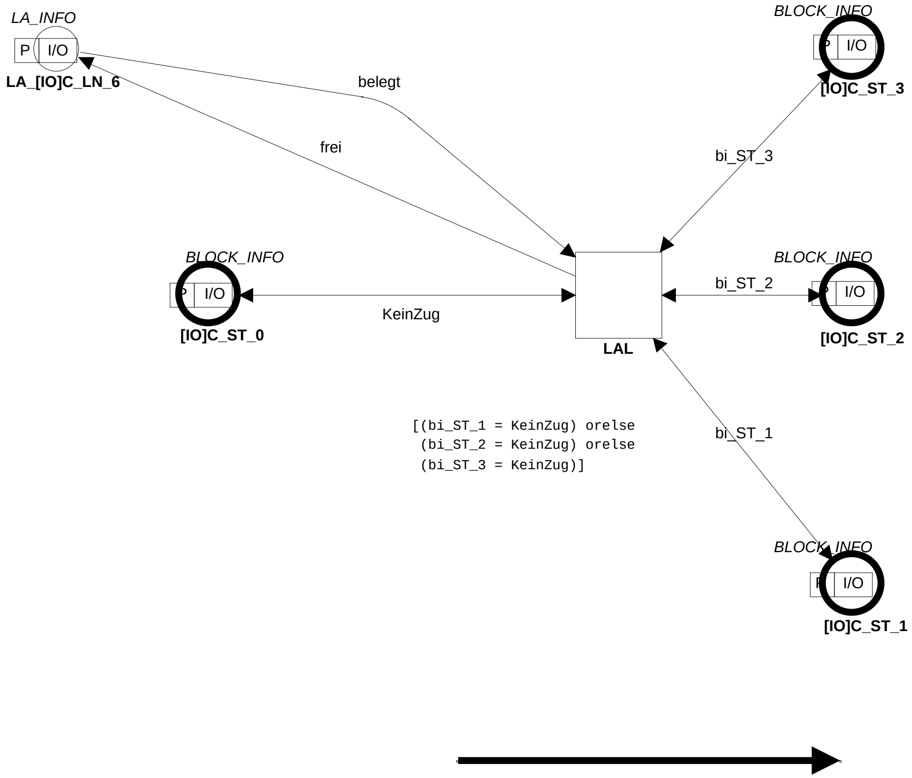
‘‘OC_MRG’’

Seite 18 **Datum: Jan-26-1998**



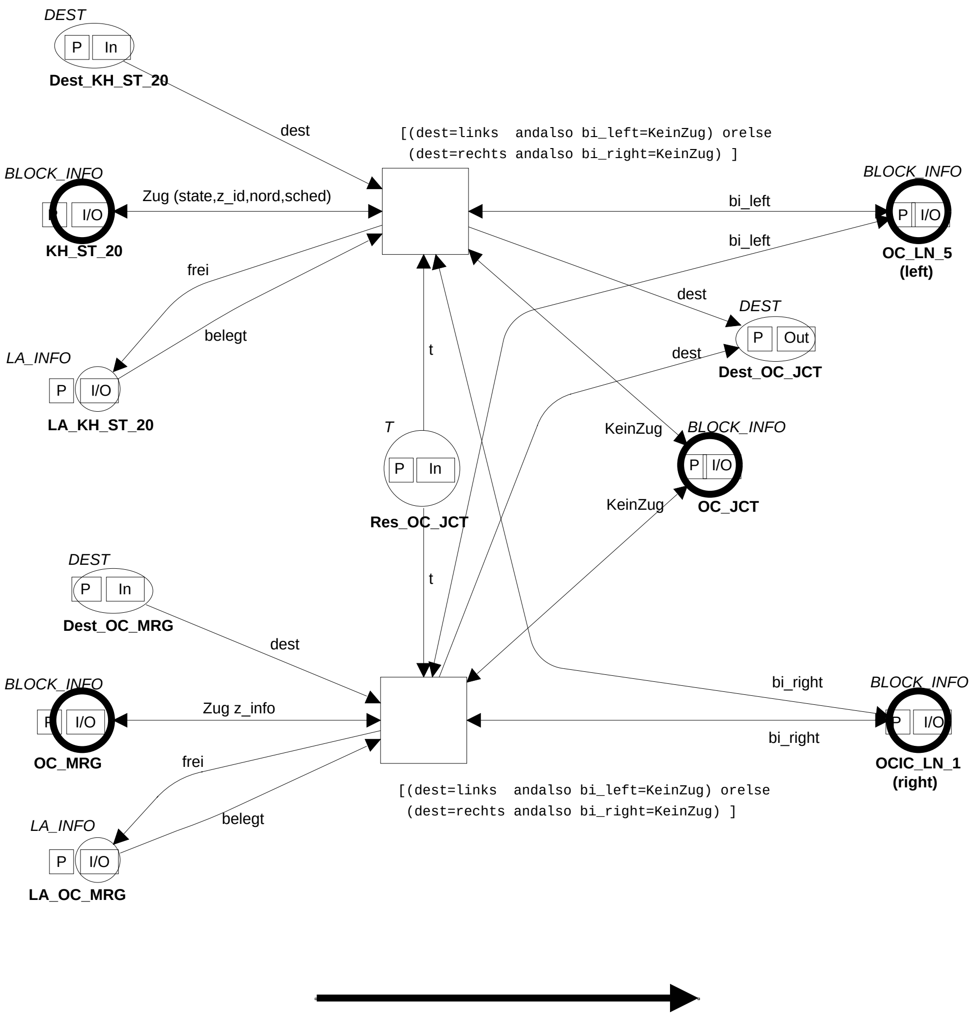
‘‘LAL_3_Split’’

Seite 3 **Datum: Jan-26-1998**



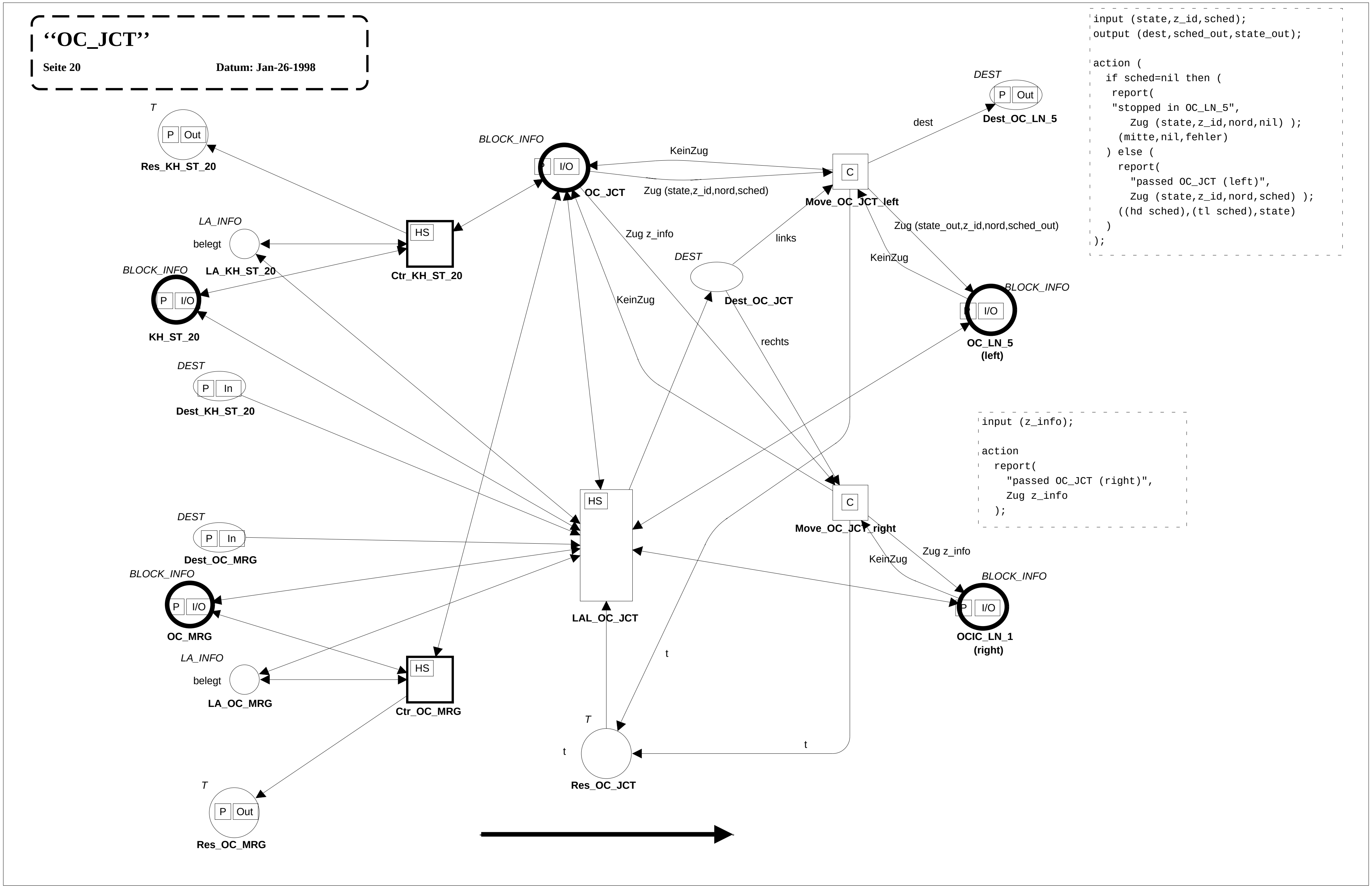
‘‘LAL_OC_JCT’’

Seite 19 **Datum: Jan-26-1998**



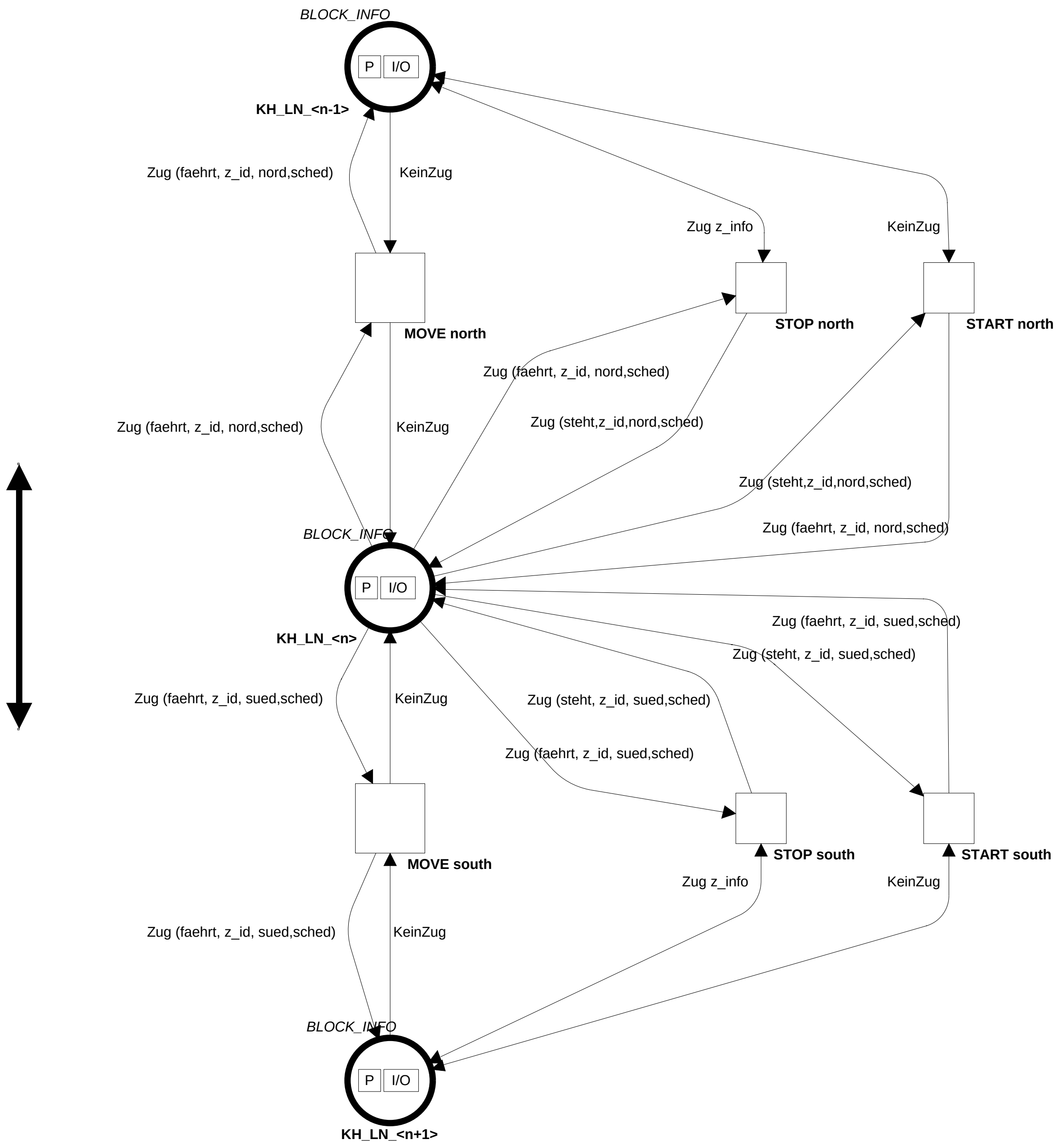
‘‘OC_JCT’’

Seite 20 **Datum: Jan-26-1998**



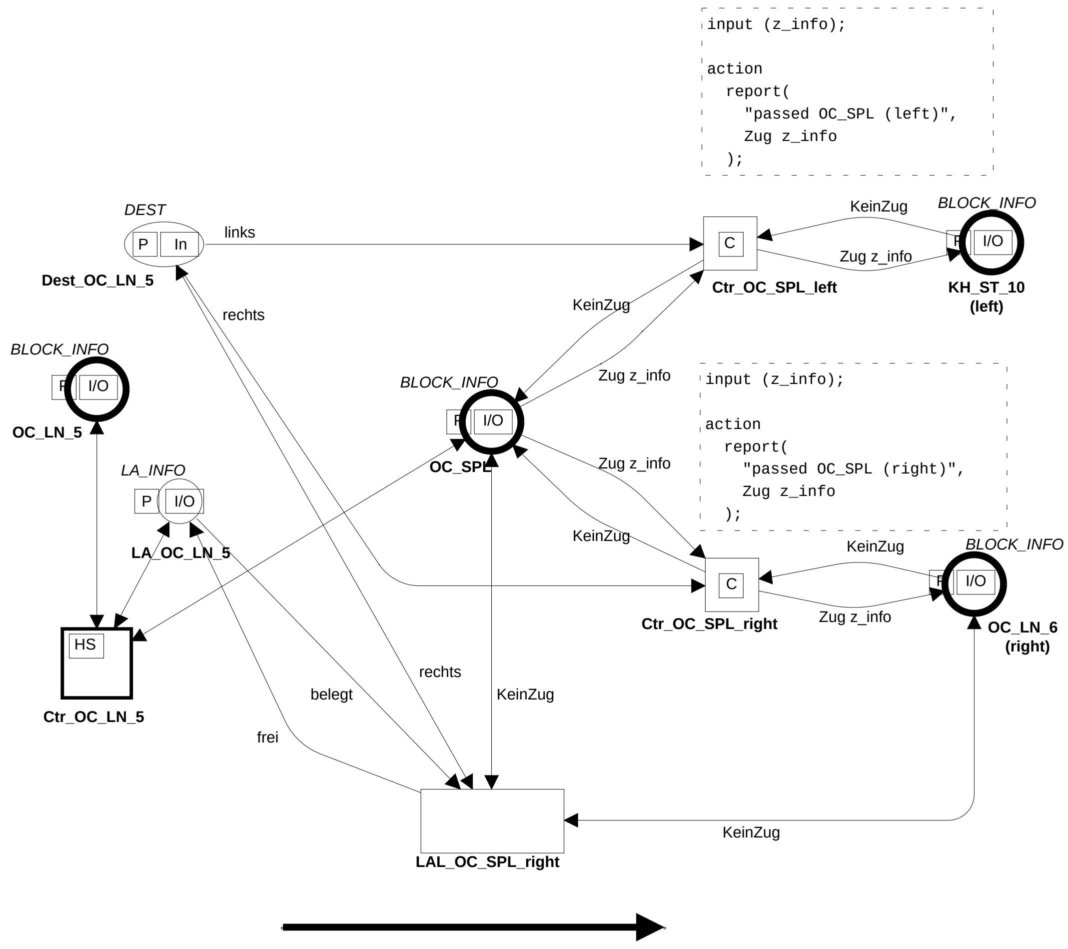
‘‘BS_LA__bi’’

Seite 22 **Datum: Jan-26-1998**



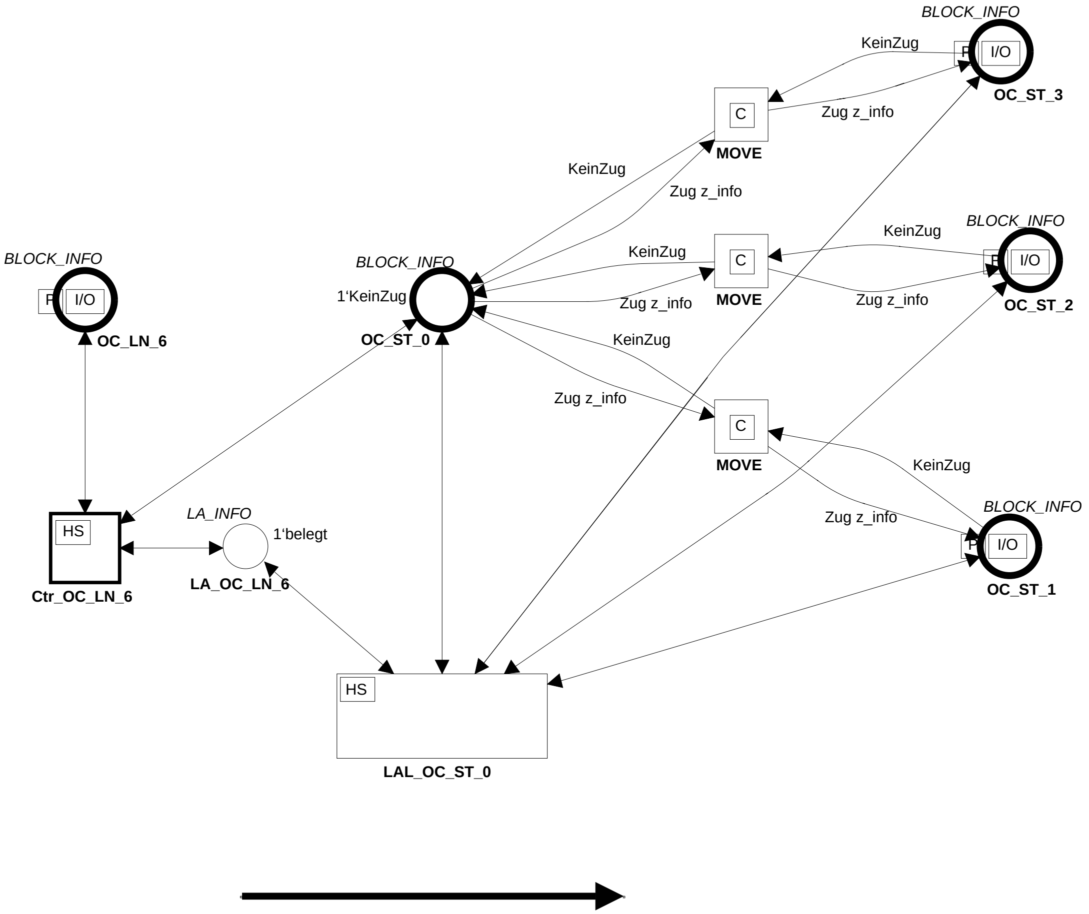
‘‘OC_SPL’’

Seite 23 **Datum: Jan-26-1998**



‘‘OCS_3_Split’’

Seite 25 **Datum: Jan-26-1998**



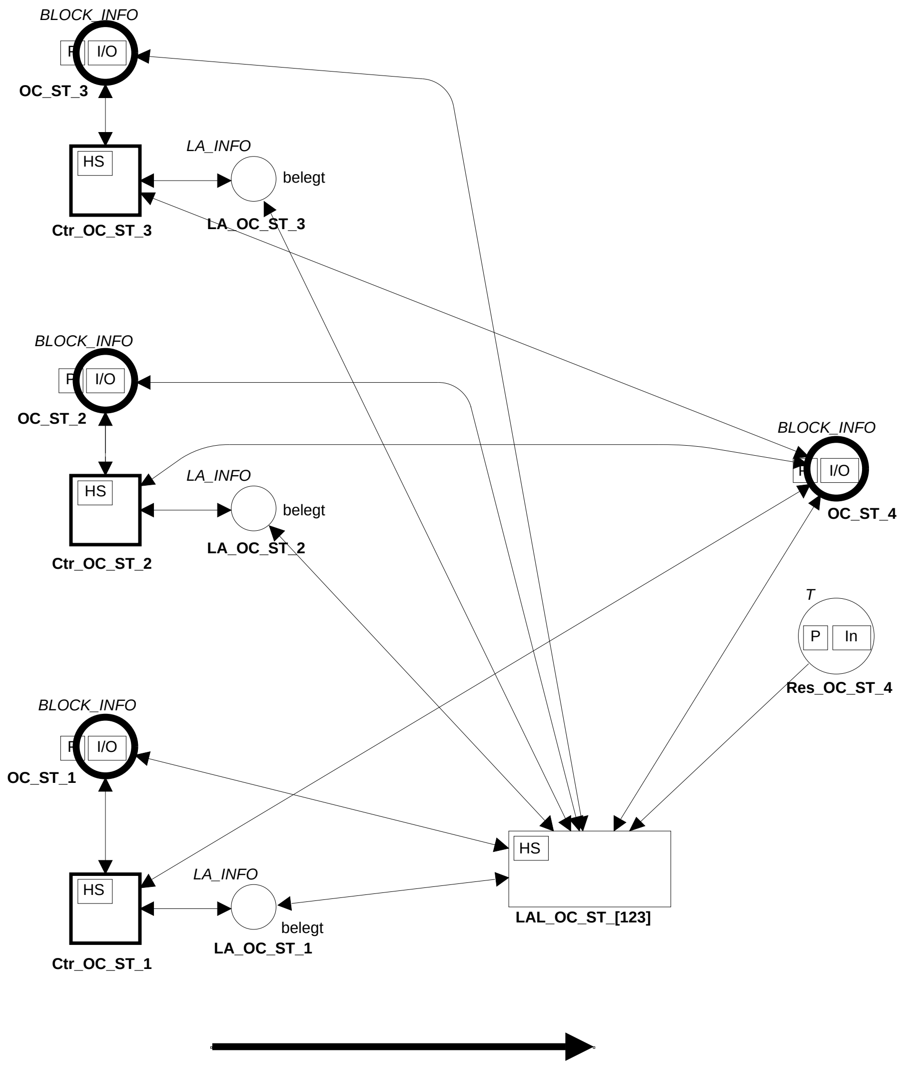

```
input (z_info);
action
   report(
     "in OuterCircleStation",
     Zug z_info );
```

```
input (z_info);
action
   report(
     "in OuterCircleStation",
     Zug z_info );
```

```
input (z_info);
action
   report(
     "in OuterCircleStation",
     Zug z_info );
```

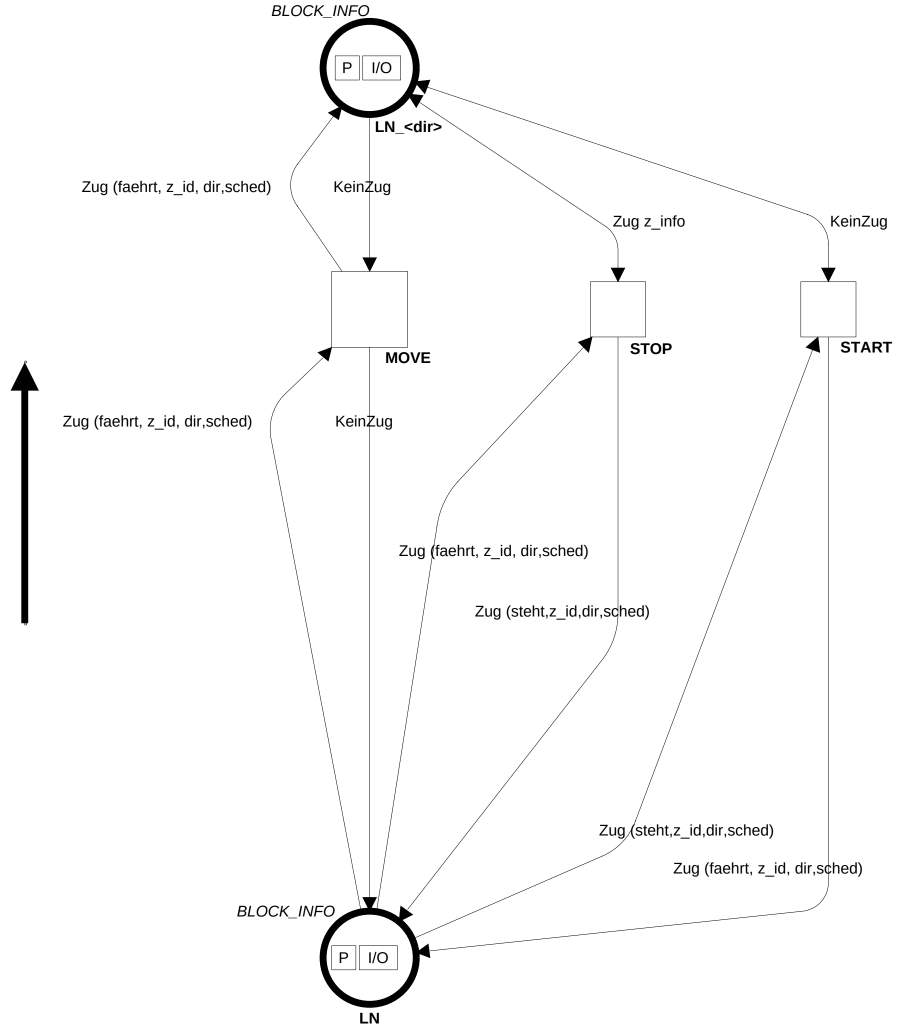
‘‘OCS_3_Merge’’

Seite 26 Datum: Jan-26-1998



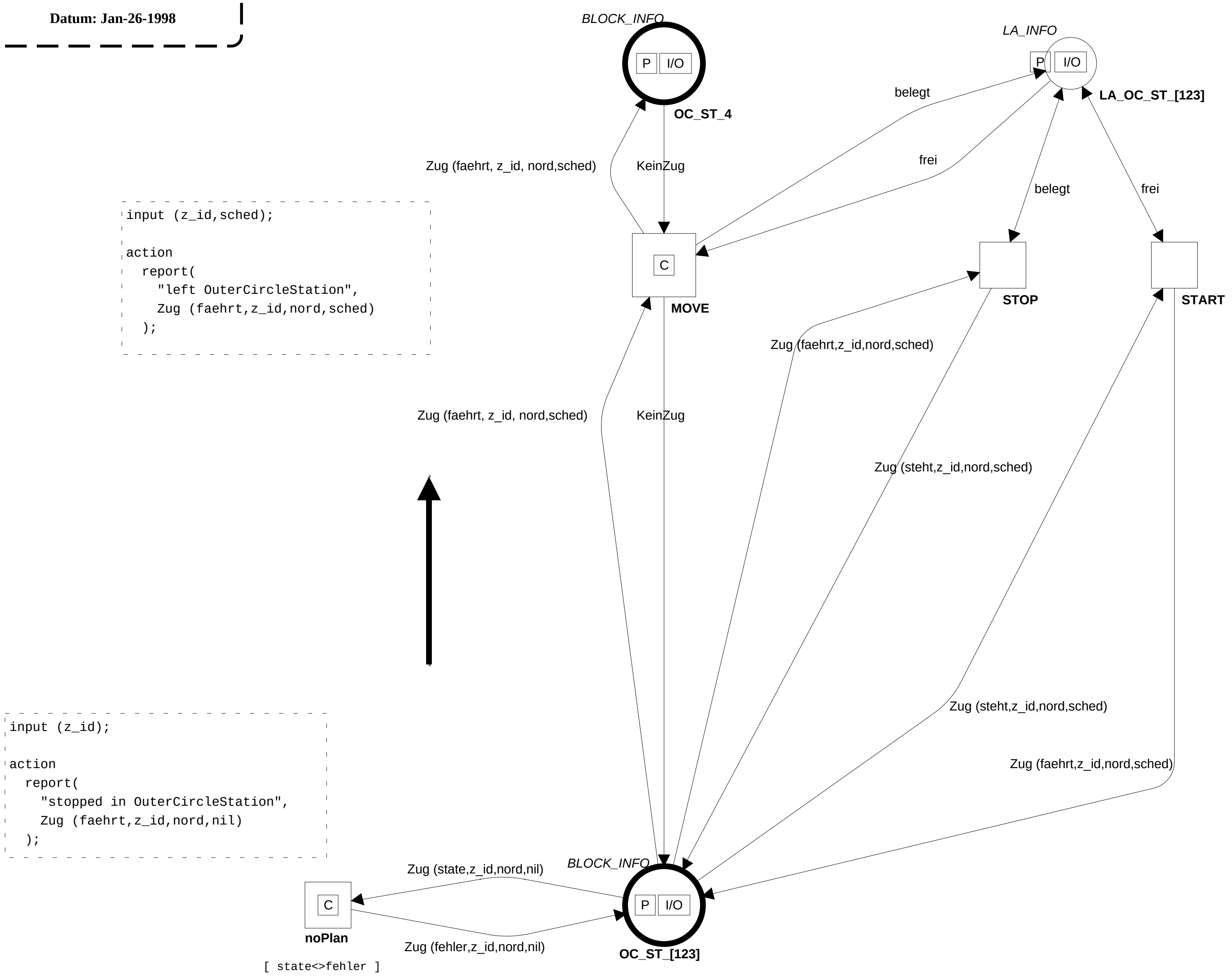
‘‘BS_LA_’’

Seite 8 **Datum: Jan-26-1998**



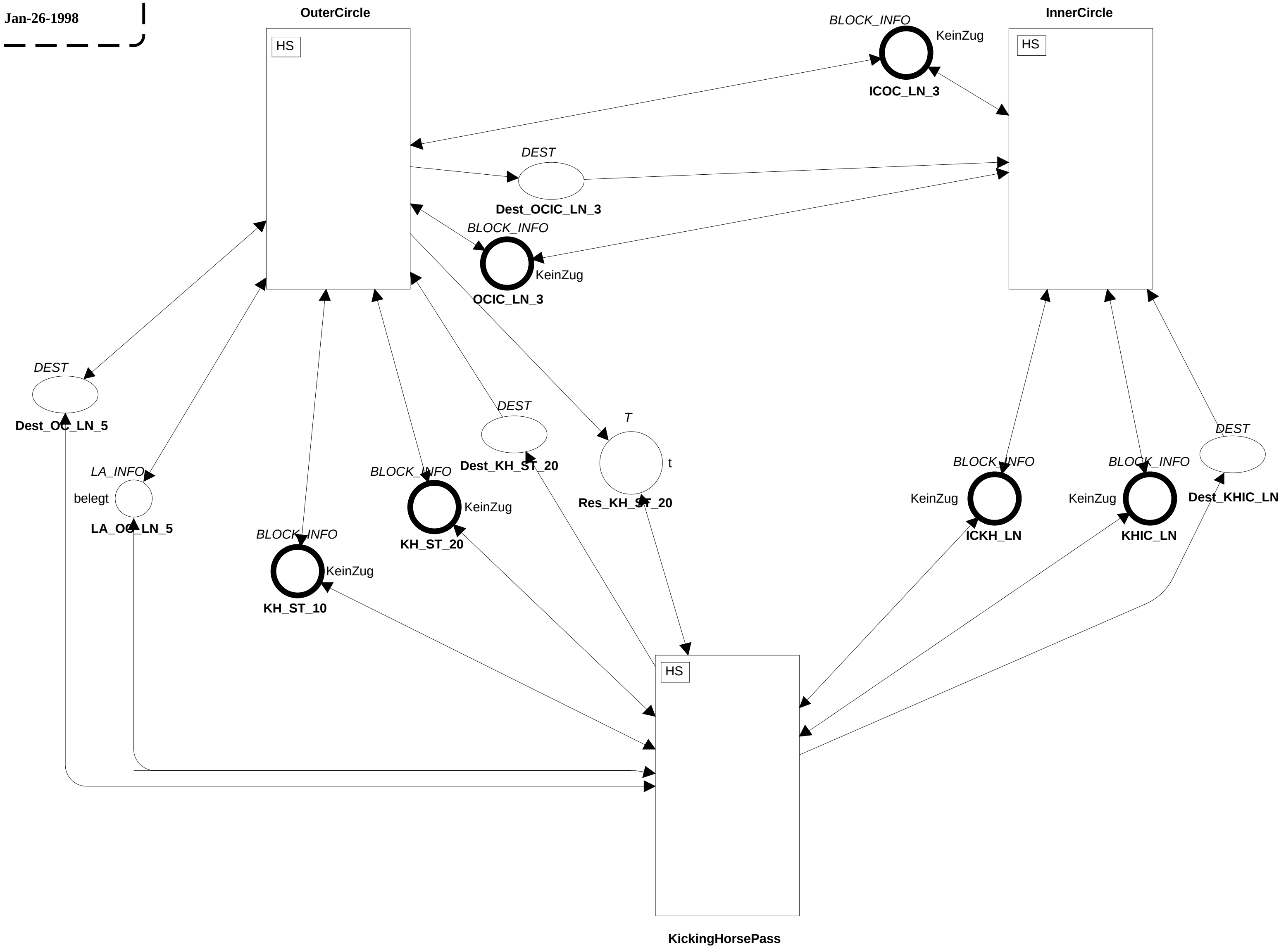
‘‘BS_OC_Station’’

Seite 27 **Datum: Jan-26-1998**



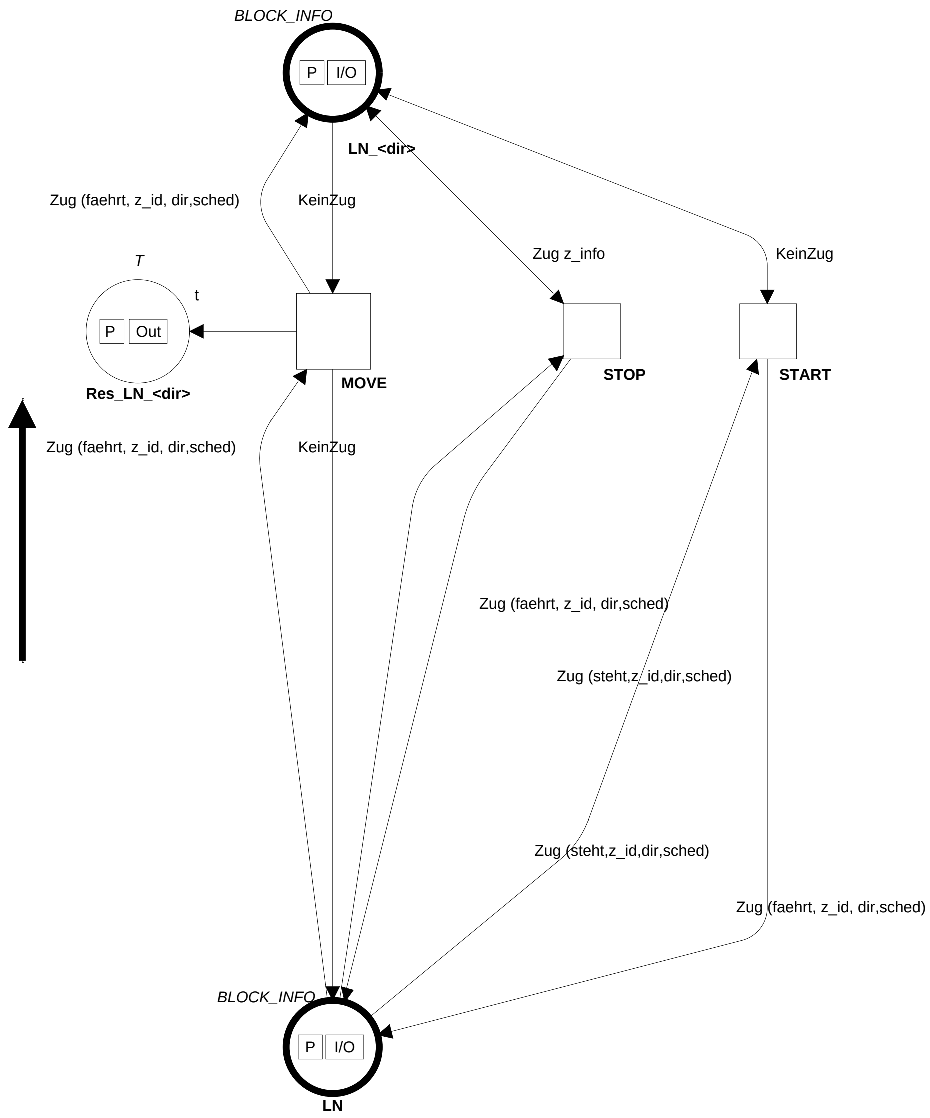
‘‘Prime’’

Seite 28 **Datum: Jan-26-1998**



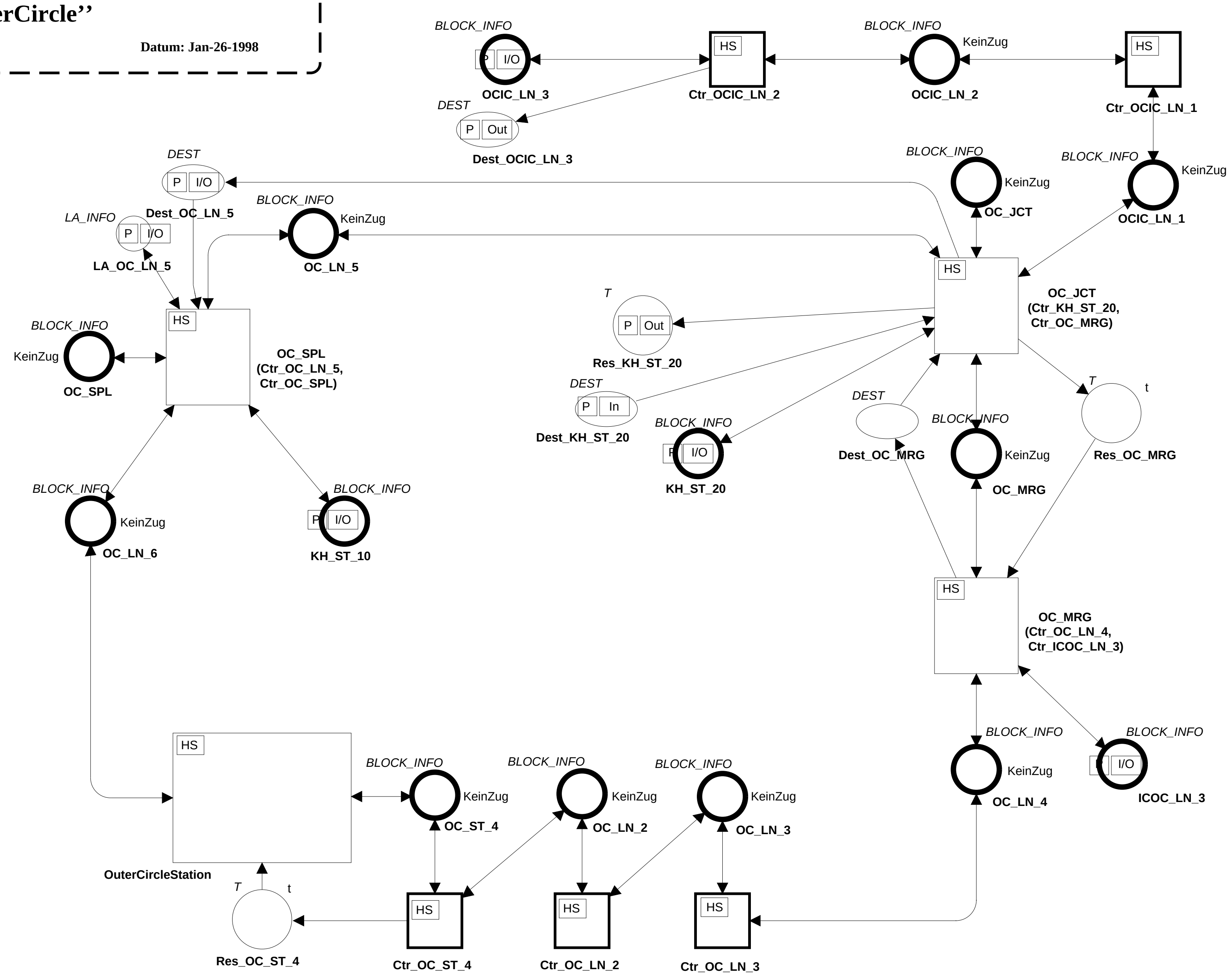
‘‘BS_LA__Rns’’

Seite 14 **Datum: Jan-26-1998**



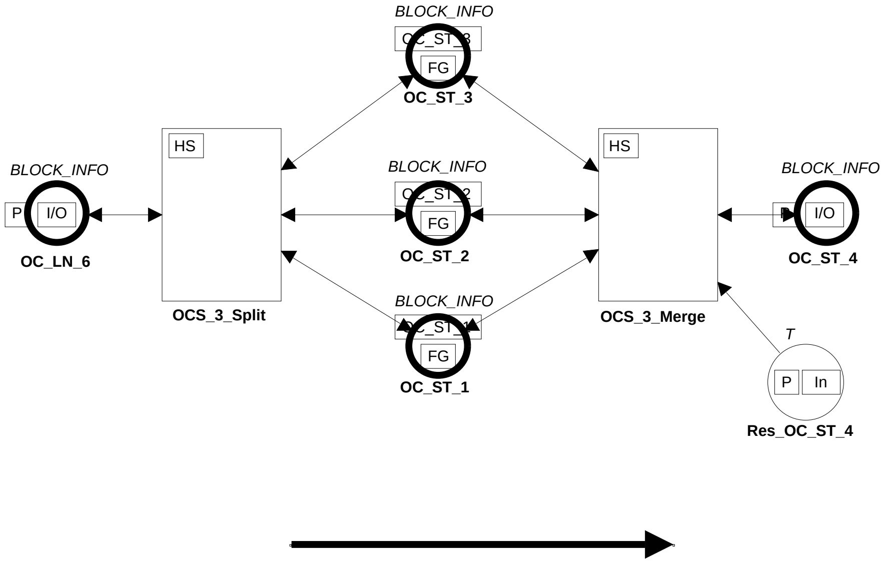
‘‘OuterCircle’’

Seite 16 **Datum: Jan-26-1998**



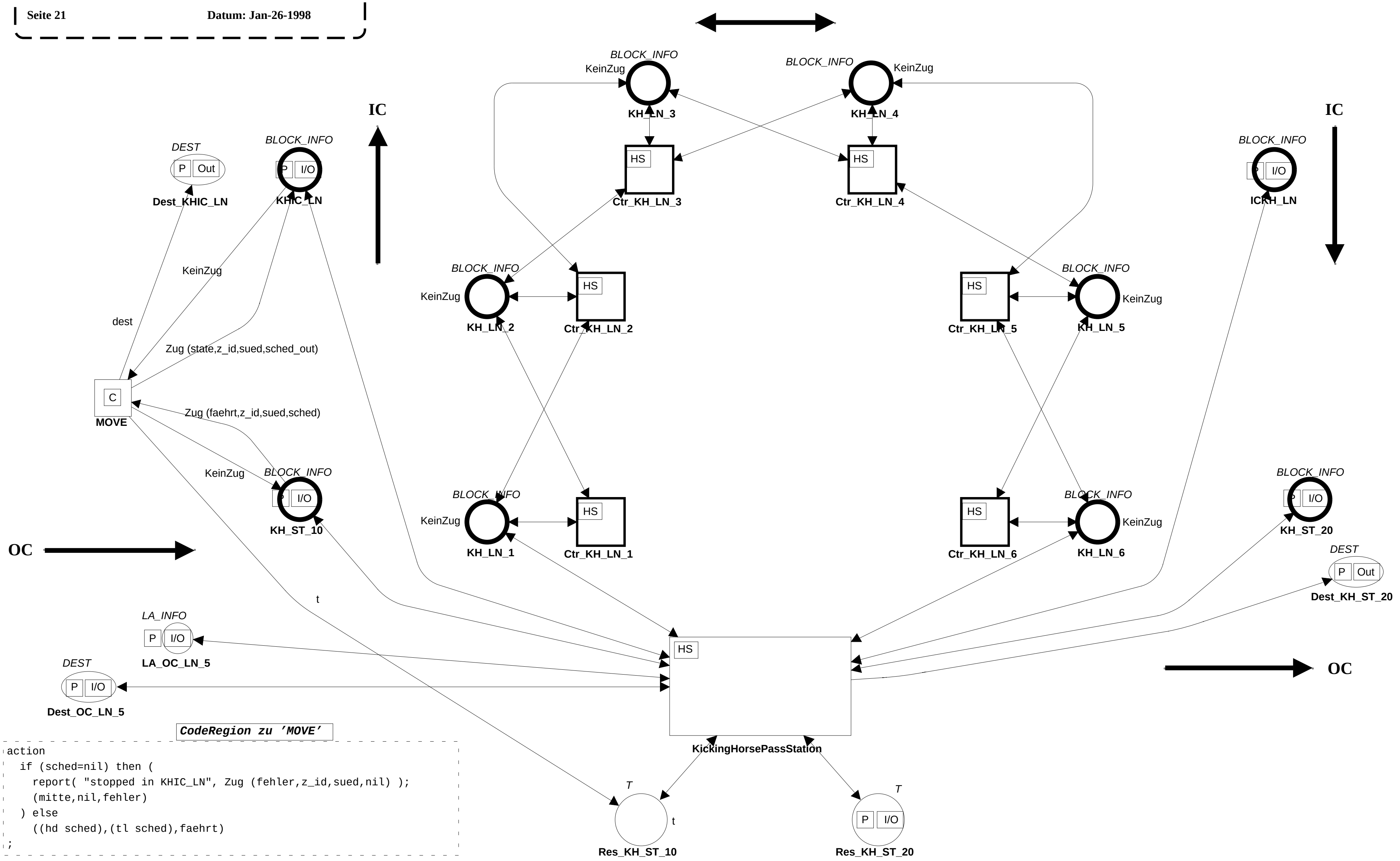
‘‘OC_Station’’

Seite 24 **Datum: Jan-26-1998**



‘‘KickingHorsePass’’

Seite 21 **Datum: Jan-26-1998**

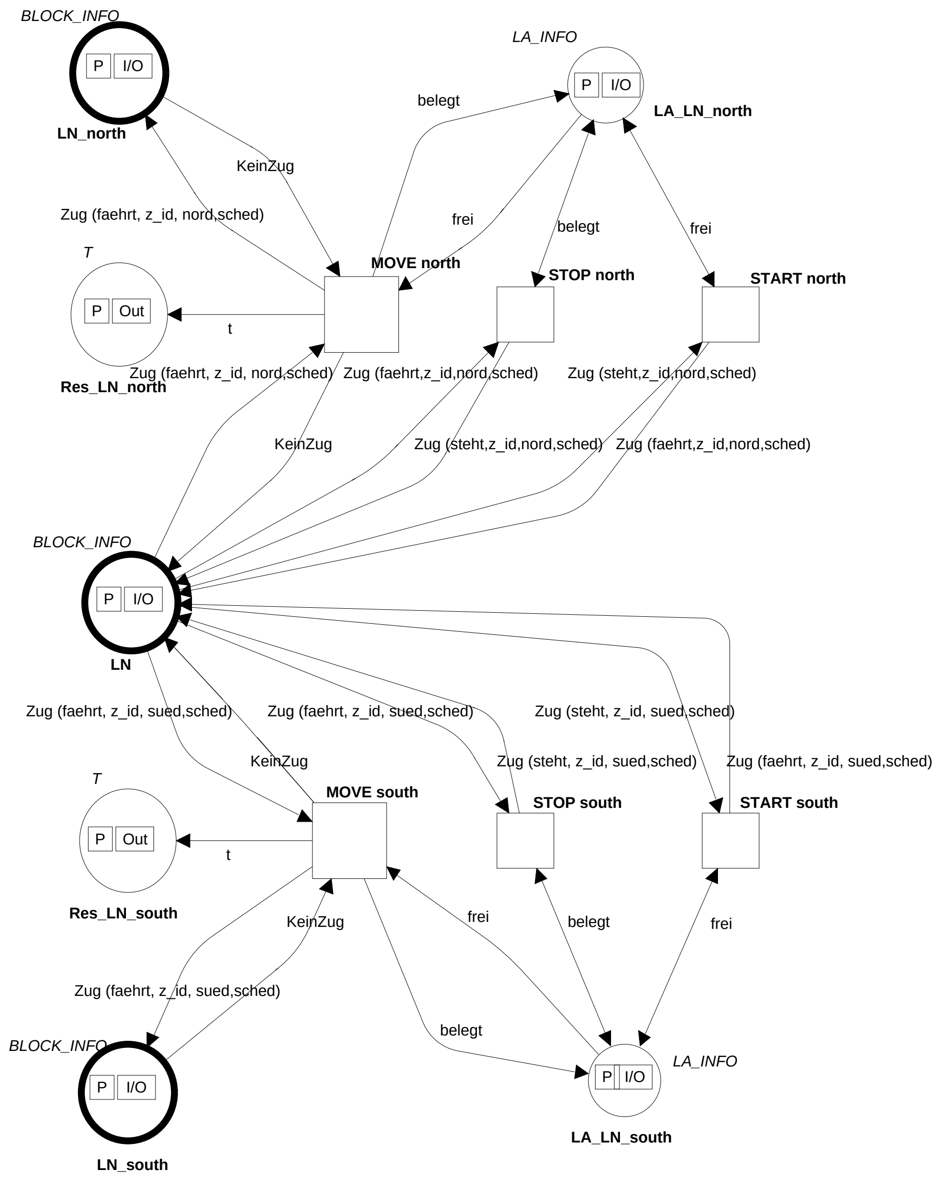


CodeRegion zu ’MOVE’

```
action
  if (sched=nil) then (
    report( "stopped in KHIC_LN", Zug (fehler,z_id,sued,nil) );
    (mitte,nil,fehler)
  ) else
    ((hd sched),(tl sched),faehrt)
;
```

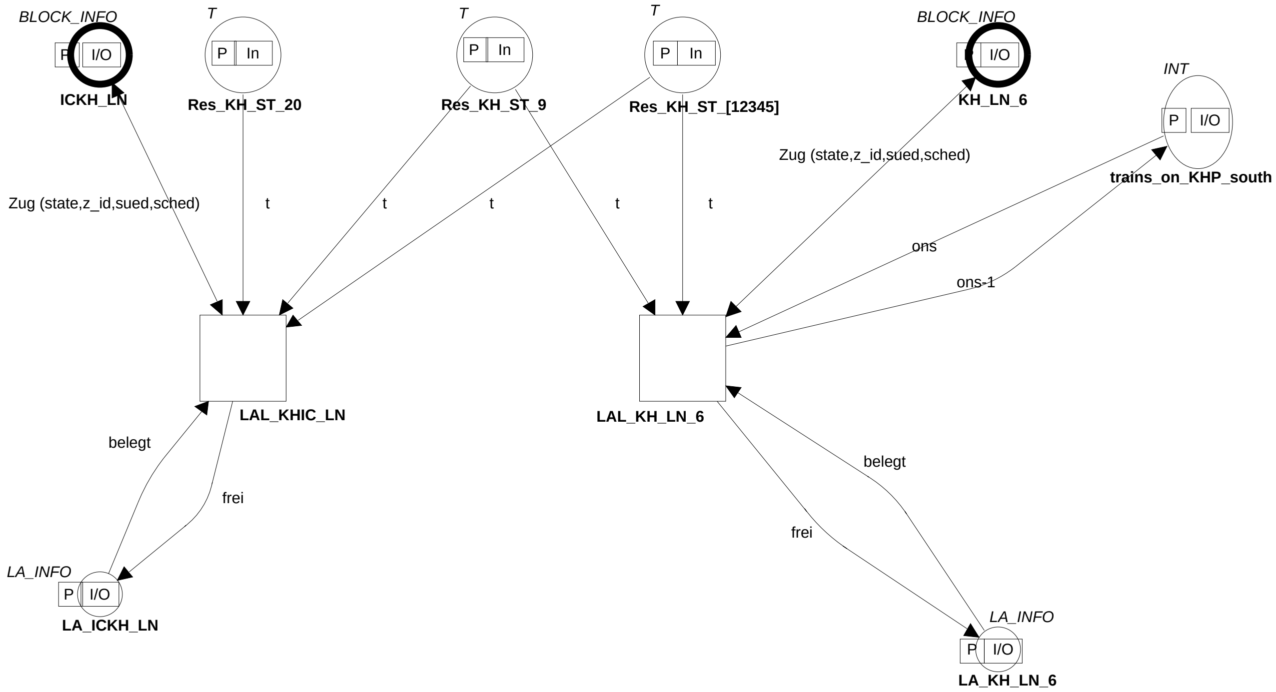
‘‘BS_LA_ns_Rns’’

Seite 38 **Datum: Jan-26-1998**



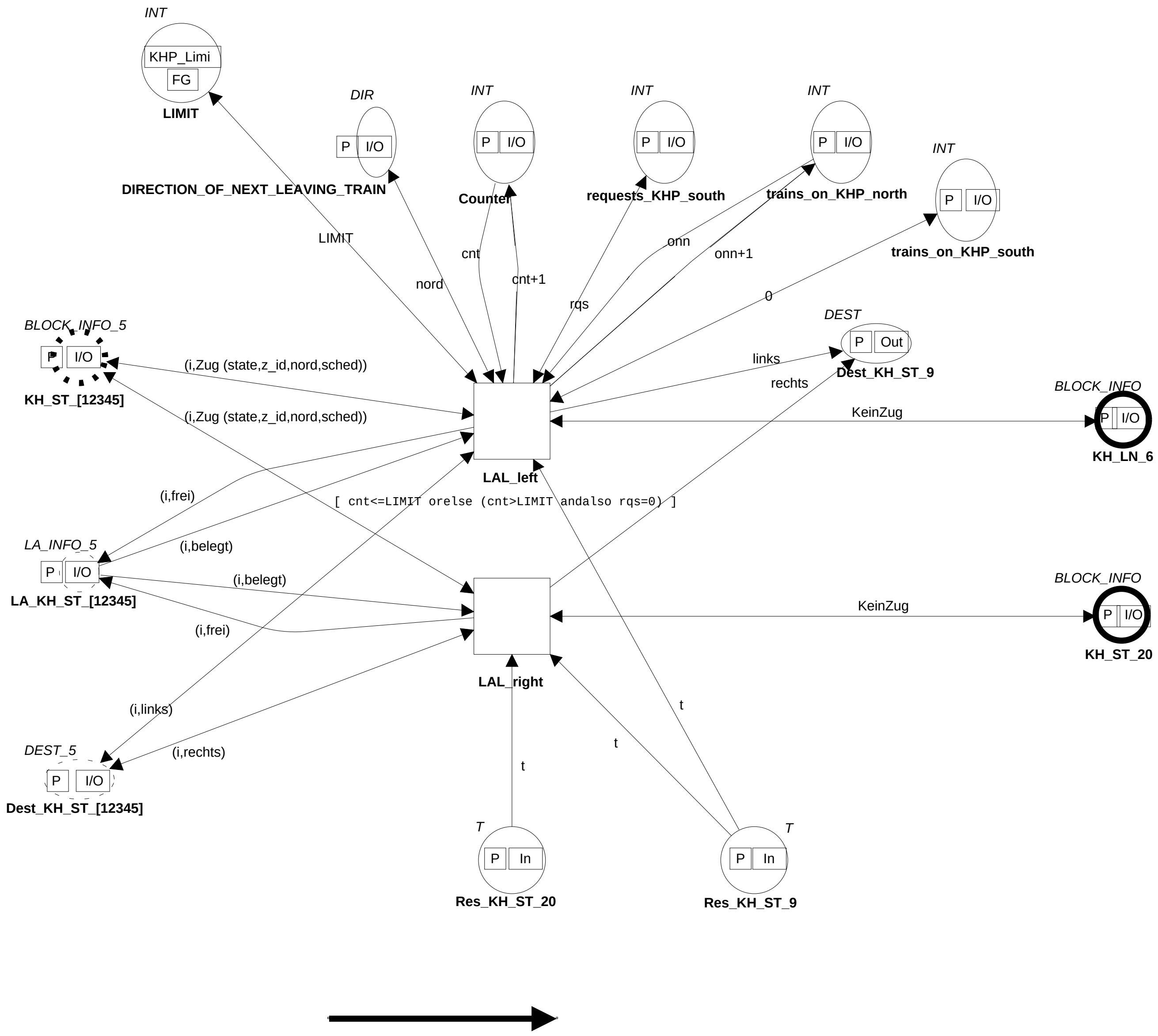
‘‘LAL_KH_ST_9_south’’

Seite 32 **Datum: Jan-26-1998**



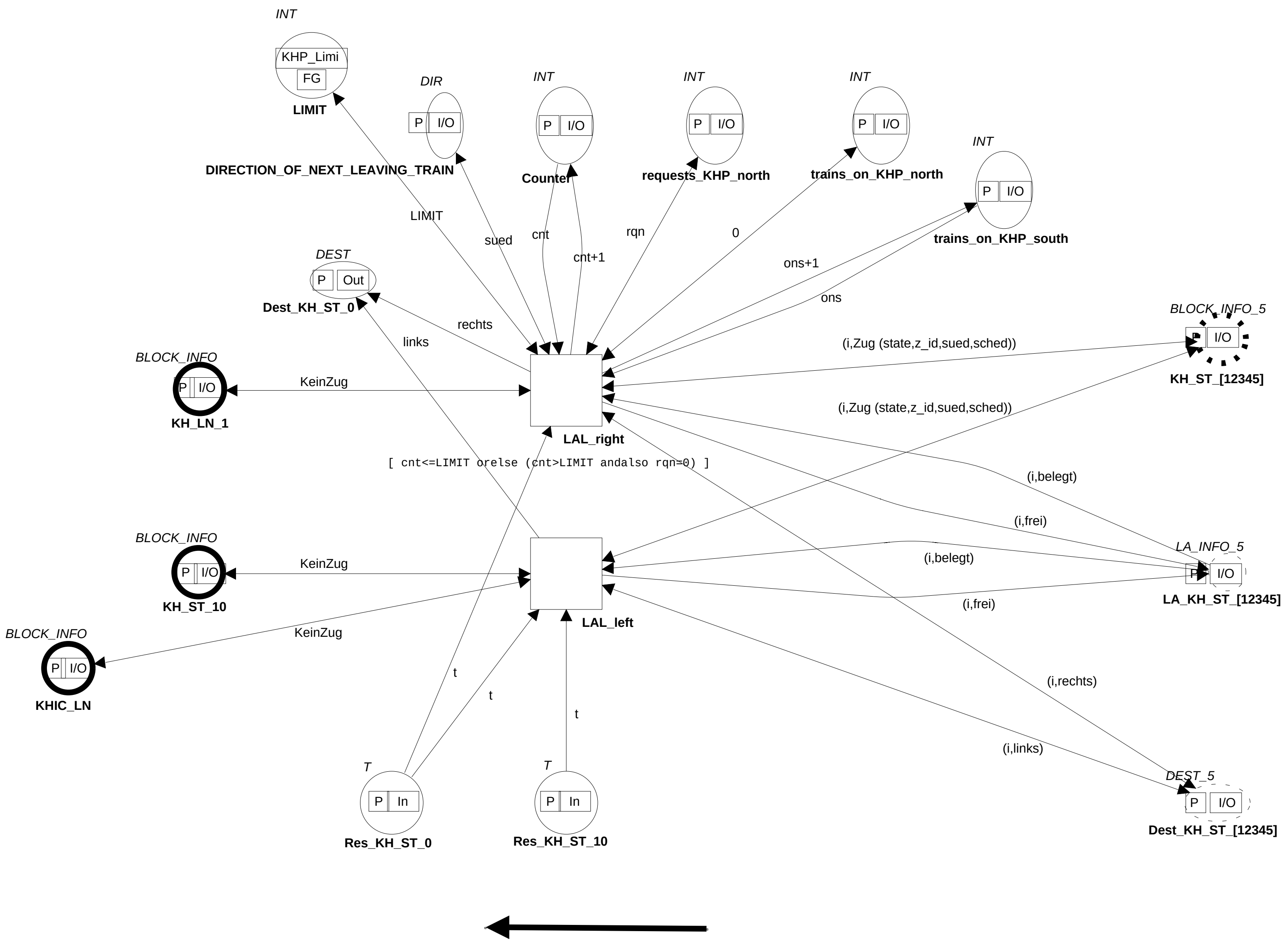
‘‘LAL_KH_ST_[12345]_north’’

Seite 33 **Datum: Jan-26-1998**



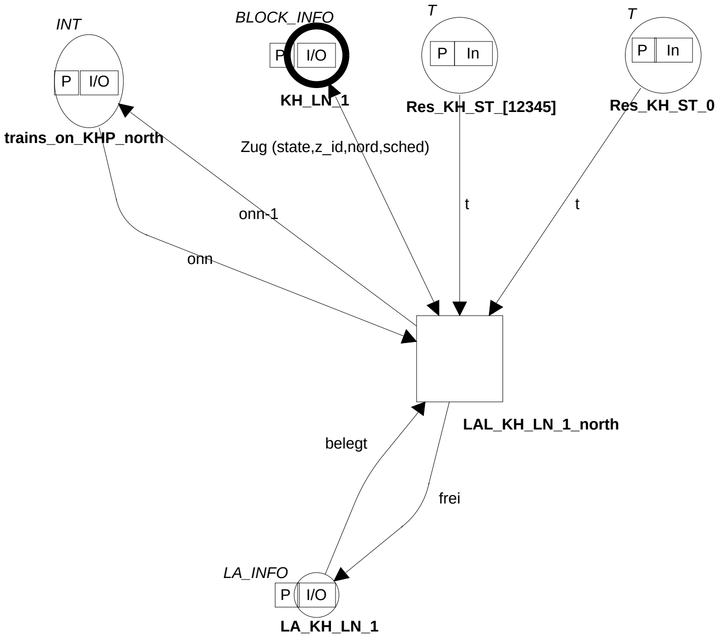
‘‘LAL_KH_ST_[12345]_south’’

Seite 35 **Datum: Jan-26-1998**



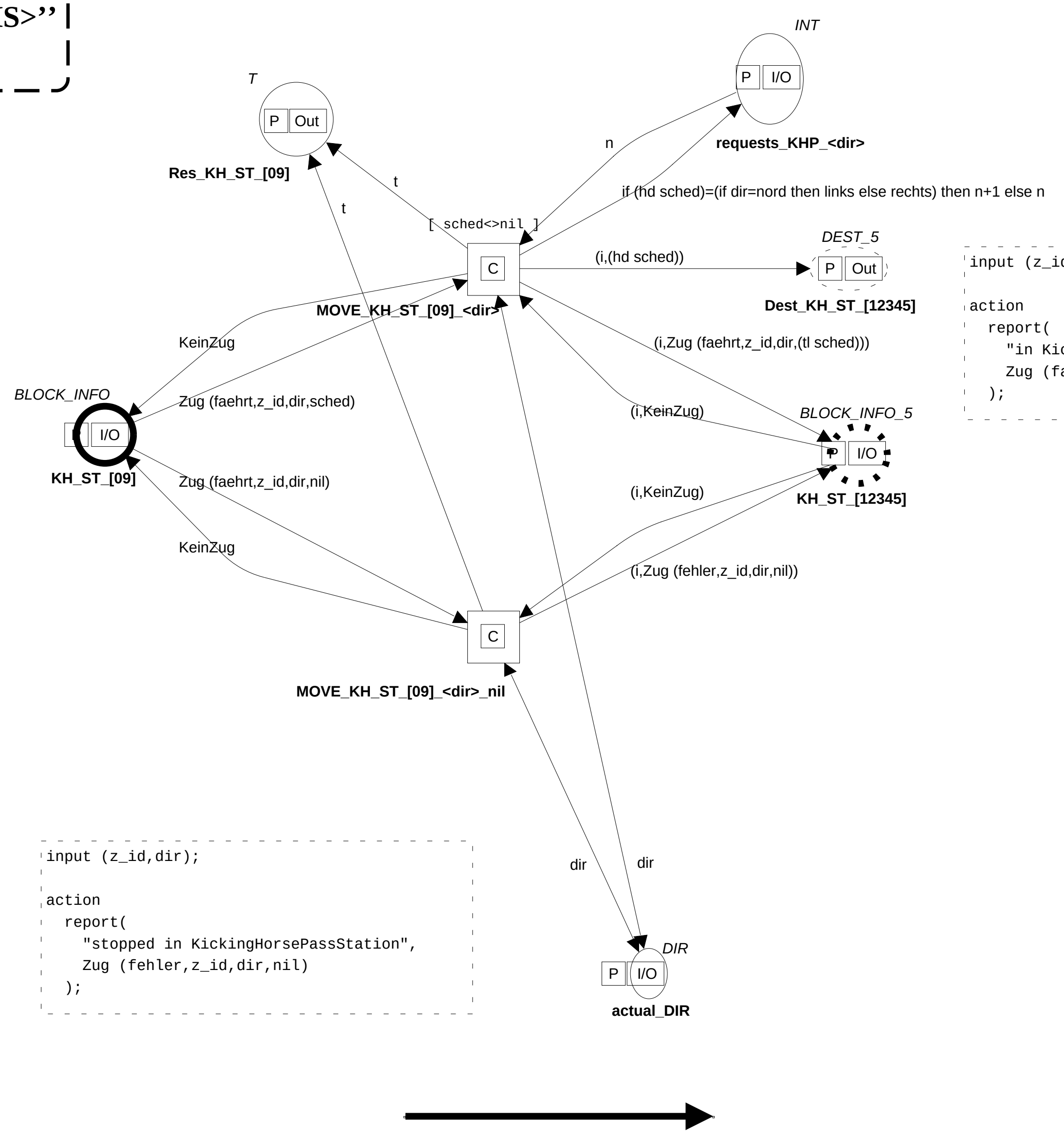
‘‘LAL_KH_ST_0_north’’

Seite 34 Datum: Jan-26-1998



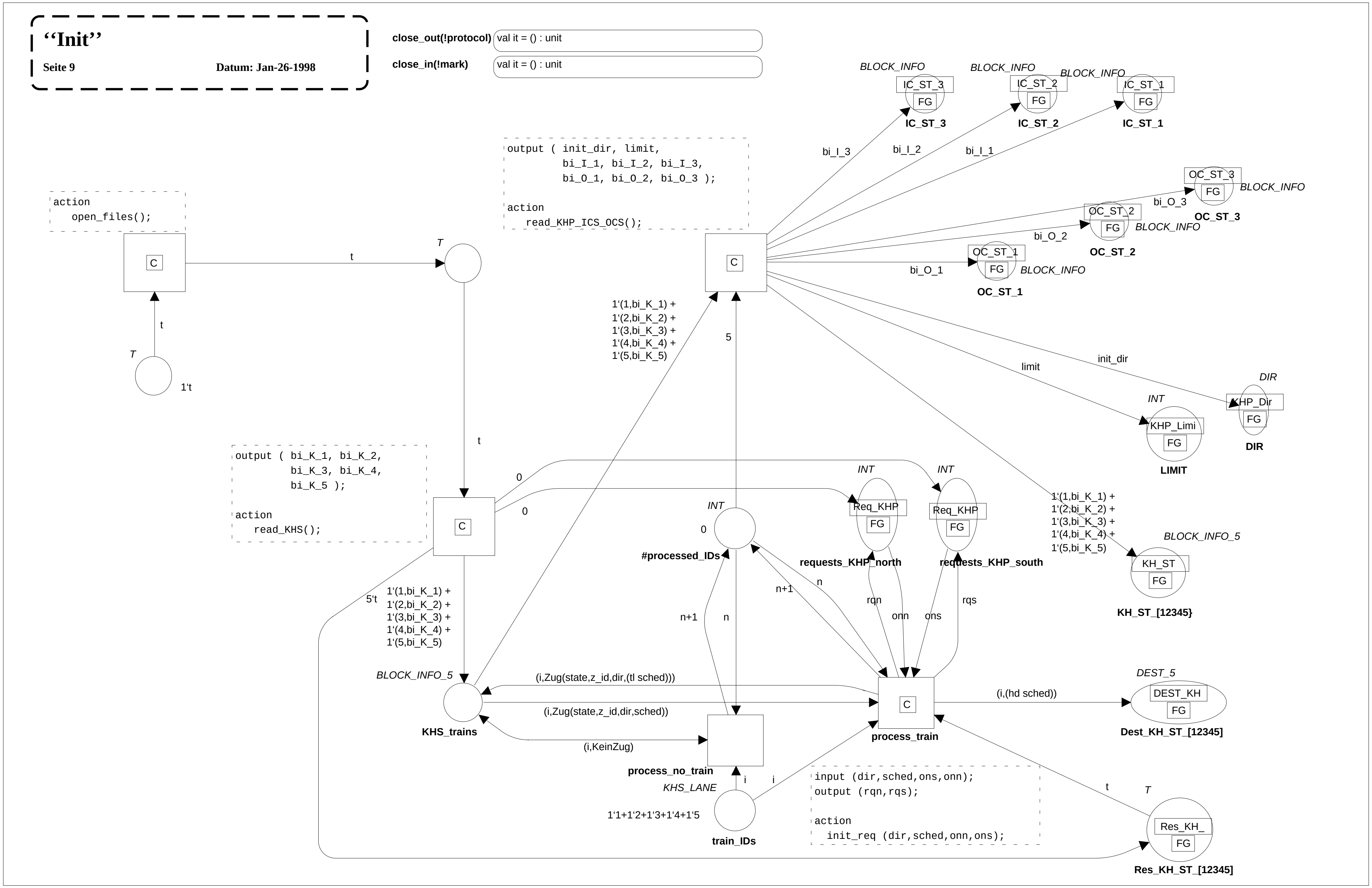
‘‘MOVE_KH_ST_[09]_<in_KHS>’’

Seite 37 **Datum: Jan-26-1998**



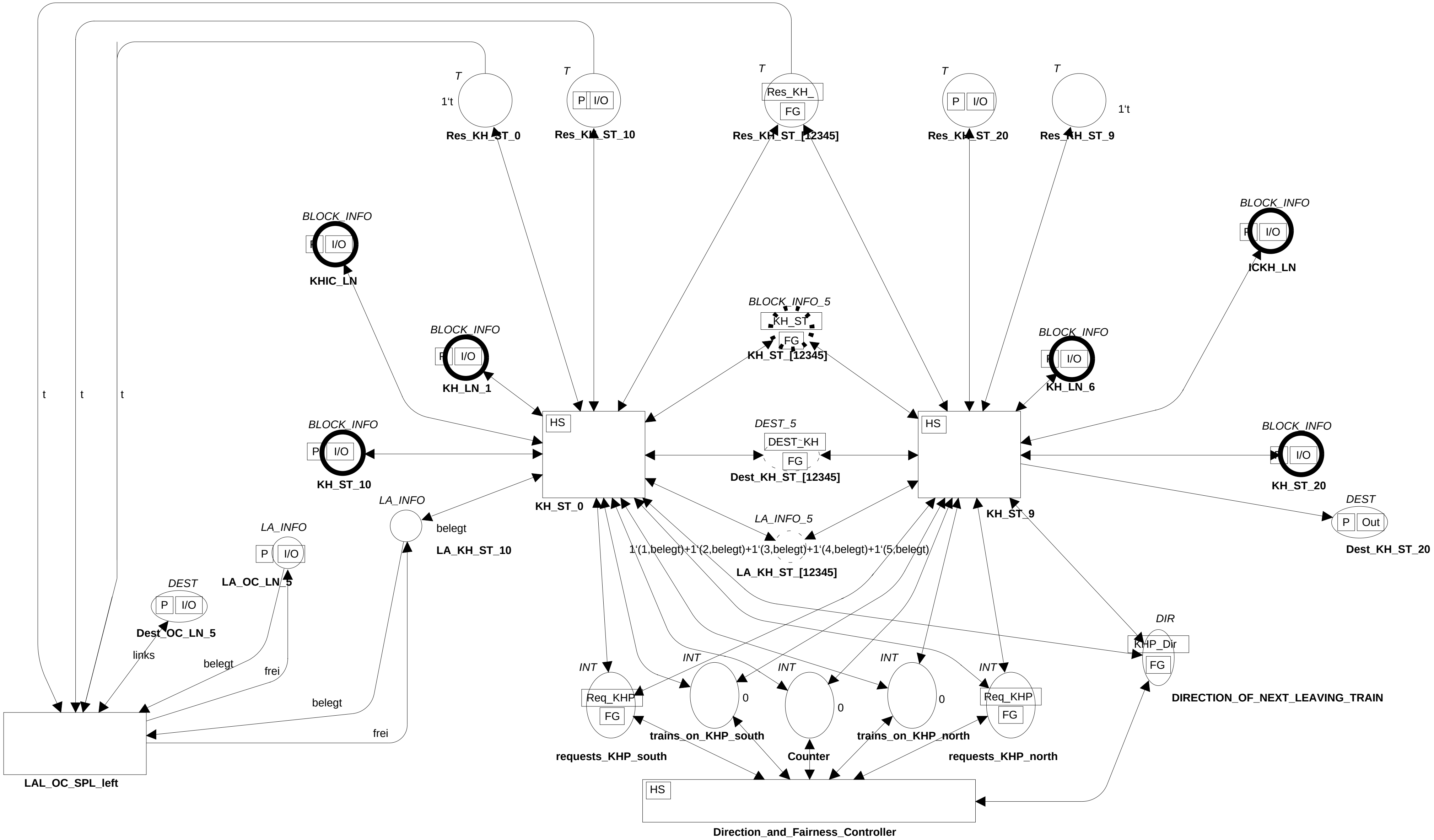

```
input (z_id,dir,sched);

action
  report(
    "in KickingHorsePassStation",
    Zug (faehrt,z_id,dir,sched)
  );
```

```
input (z_id,dir);

action
  report(
    "stopped in KickingHorsePassStation",
    Zug (fehler,z_id,dir,nil)
  );
```


''Init''
Seite 9
Datum: Jan-26-1998
close_out(!protocol)
val it = () : unit
close_in(!mark)
val it = () : unit
action
open_files();
output (init_dir, limit,
bi_I_1, bi_I_2, bi_I_3,
bi_O_1, bi_O_2, bi_O_3);
action
read_KHP_ICS_OCS();
output (bi_K_1, bi_K_2,
bi_K_3, bi_K_4,
bi_K_5);
action
read_KHS();
input (dir,sched,ons,onn);
output (rqn,rqs);
action
init_req (dir,sched,onn,ons);
C
t
T
1't
5
0
1'(1,bi_K_1) +
1'(2,bi_K_2) +
1'(3,bi_K_3) +
1'(4,bi_K_4) +
1'(5,bi_K_5)
5't
bi_I_3
bi_I_2
bi_I_1
bi_O_3
bi_O_2
bi_O_1
BLOCK_INFO
IC_ST_3
IC_ST_2
IC_ST_1
OC_ST_3
OC_ST_2
OC_ST_1
FG
limit
init_dir
INT
DIR
KHP_Limi
KHP_Dir
LIMIT
BLOCK_INFO_5
KH_ST
KH_ST_[12345}
Req_KHP
requests_KHP_north
requests_KHP_south
#processed_IDs
n+1
n
rqn
onn
ons
rqs
KHS_trains
(i,Zug(state,z_id,dir,(tl sched)))
(i,Zug(state,z_id,dir,sched))
(i,KeinZug)
(i,(hd sched))
process_train
process_no_train
DEST_5
DEST_KH
Dest_KH_ST_[12345]
KHS_LANE
1'1+1'2+1'3+1'4+1'5
train_IDs
i
Res_KH_
Res_KH_ST_[12345]

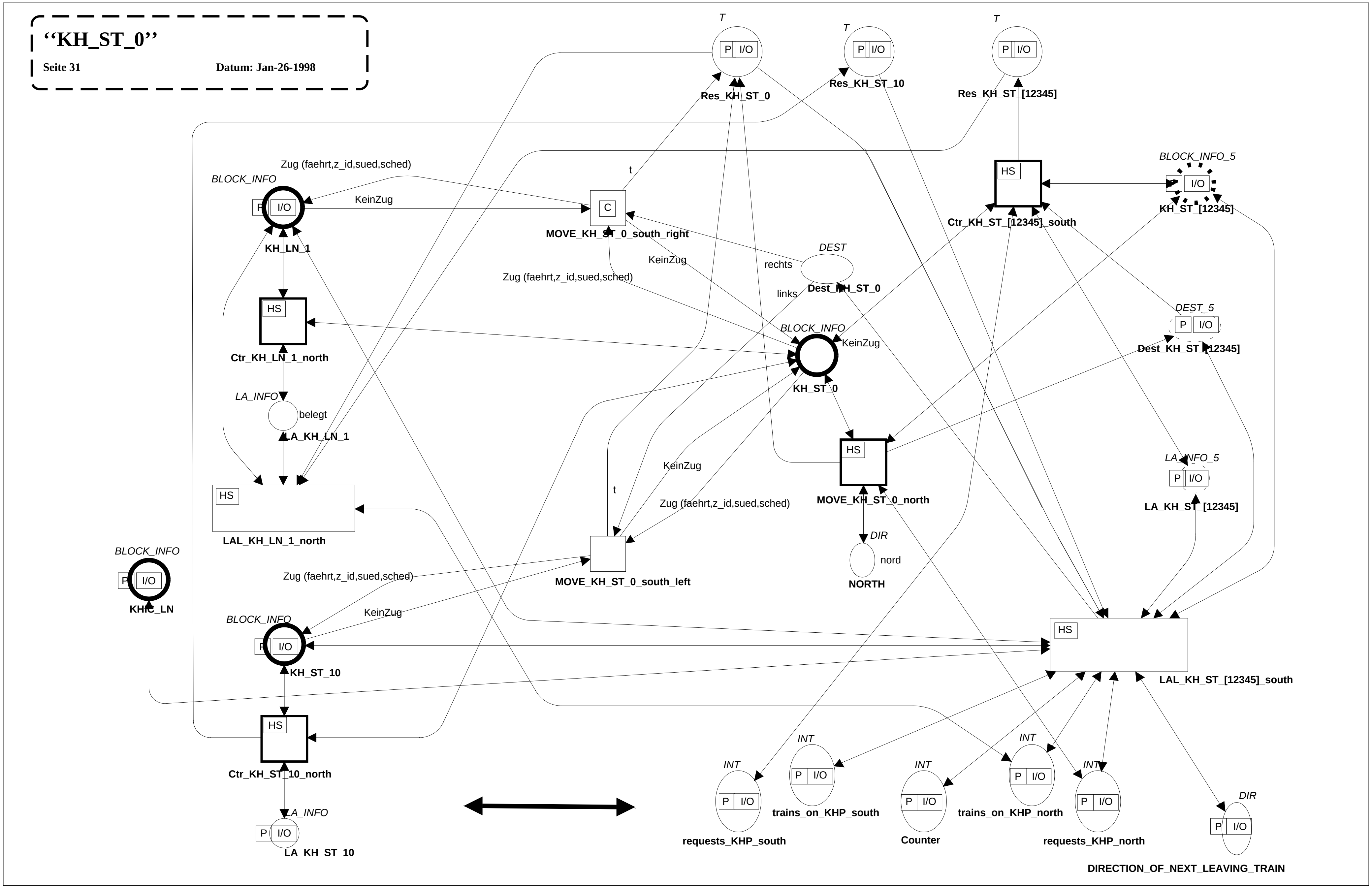
‘‘KH_Station’’

Seite 29 **Datum: Jan-26-1998**



‘‘KH_ST_0’’

Seite 31 **Datum: Jan-26-1998**

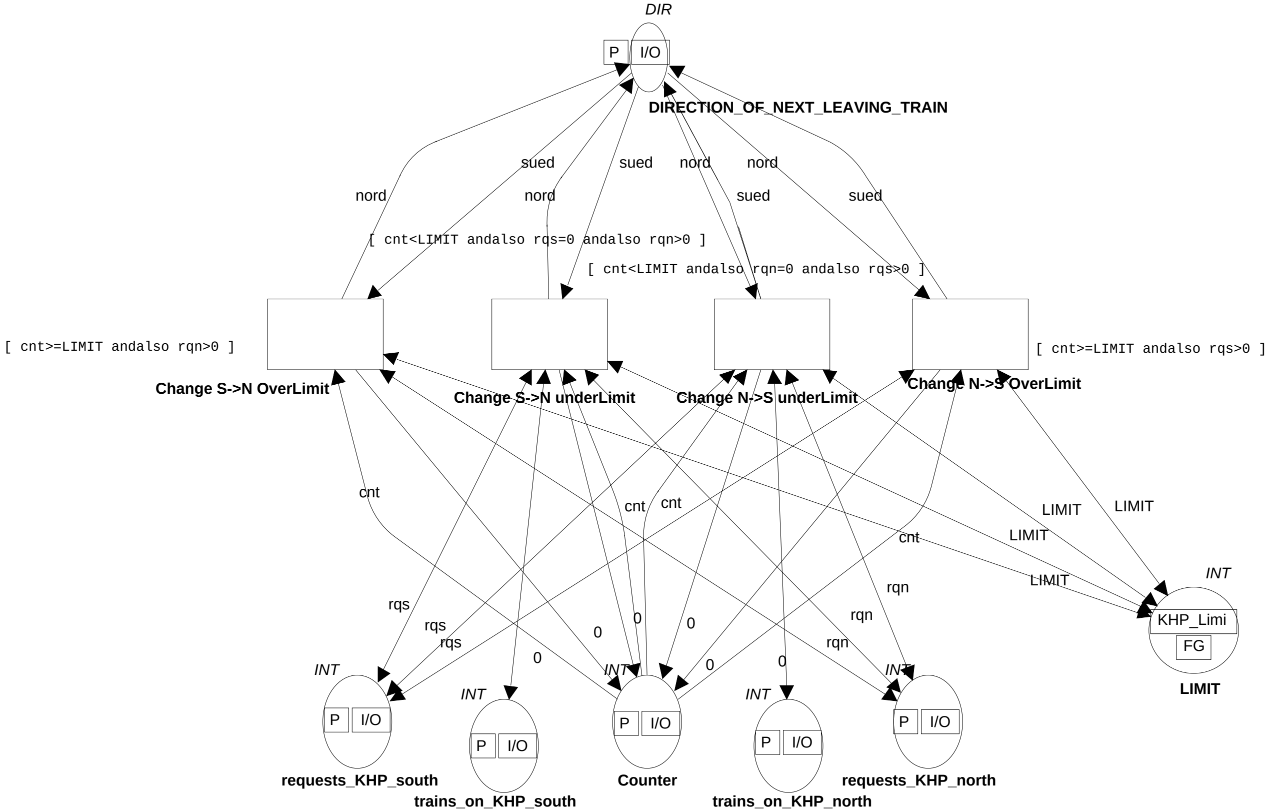


<<No errors>>

```
color INT = int
      declare input_ms;
 var n,cnt : INT;
 var rqn, rqs : INT;
 var onn, ons : INT;
 var LIMIT : INT;
 var limit : INT ms;

color T = unit with t;

color STATE = with steht | faehrt | fehler;
 var state : STATE;
 var state_out : STATE;

color ZUG_ID = int;
 var z_id : ZUG_ID;

color DIR = bool with (nord, sued)
      declare input_ms;
 var dir : DIR;
 var init_dir : DIR ms;

color DEST = with links | mitte | rechts;
 var dest : DEST;

color SCHEDULE = list DEST;
 var sched : SCHEDULE;
 var sched_out : SCHEDULE;

color ZUG_INFO = product STATE * ZUG_ID * DIR * SCHEDULE;
 var z_info : ZUG_INFO;

color BLOCK_INFO = union Zug:ZUG_INFO + KeinZug
      declare mkst_col, input_ms;
 var bi_ST_1, bi_ST_2, bi_ST_3 : BLOCK_INFO;
 var bi_left, bi_middle, bi_right : BLOCK_INFO;
 var bi_I_1, bi_I_2, bi_I_3 : BLOCK_INFO;
 var bi_O_1, bi_O_2, bi_O_3 : BLOCK_INFO;
 var bi_K_1, bi_K_2, bi_K_3, bi_K_4, bi_K_5 : BLOCK_INFO;

color LA_INFO = bool with (belegt, frei);

color KHS_LANE = int with 1..5;
 var i : KHS_LANE;

color BLOCK_INFO_5 = product KHS_LANE * BLOCK_INFO;
color DEST_5       = product KHS_LANE * DEST;
color LA_INFO_5    = product KHS_LANE * LA_INFO;


globref protfile = "DieBahn.prot";
globref protocol = std_out;
```

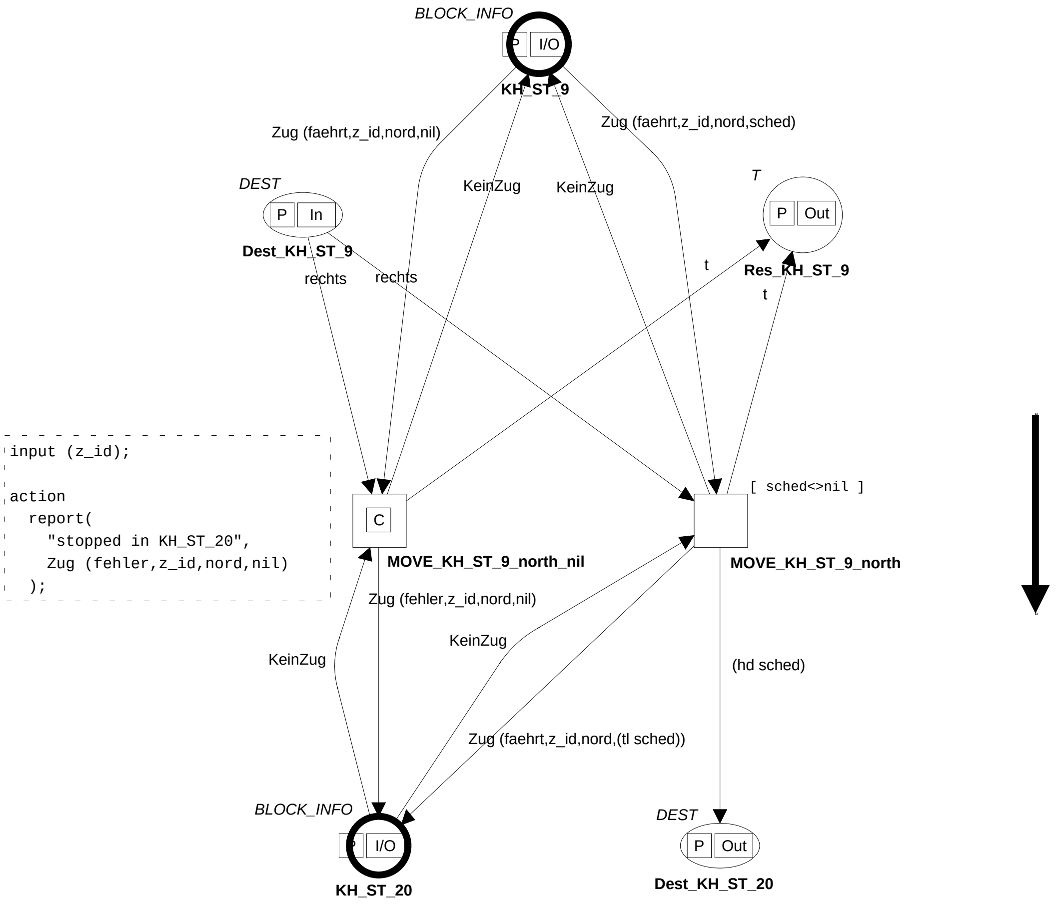
‘‘KHP_Controller’’

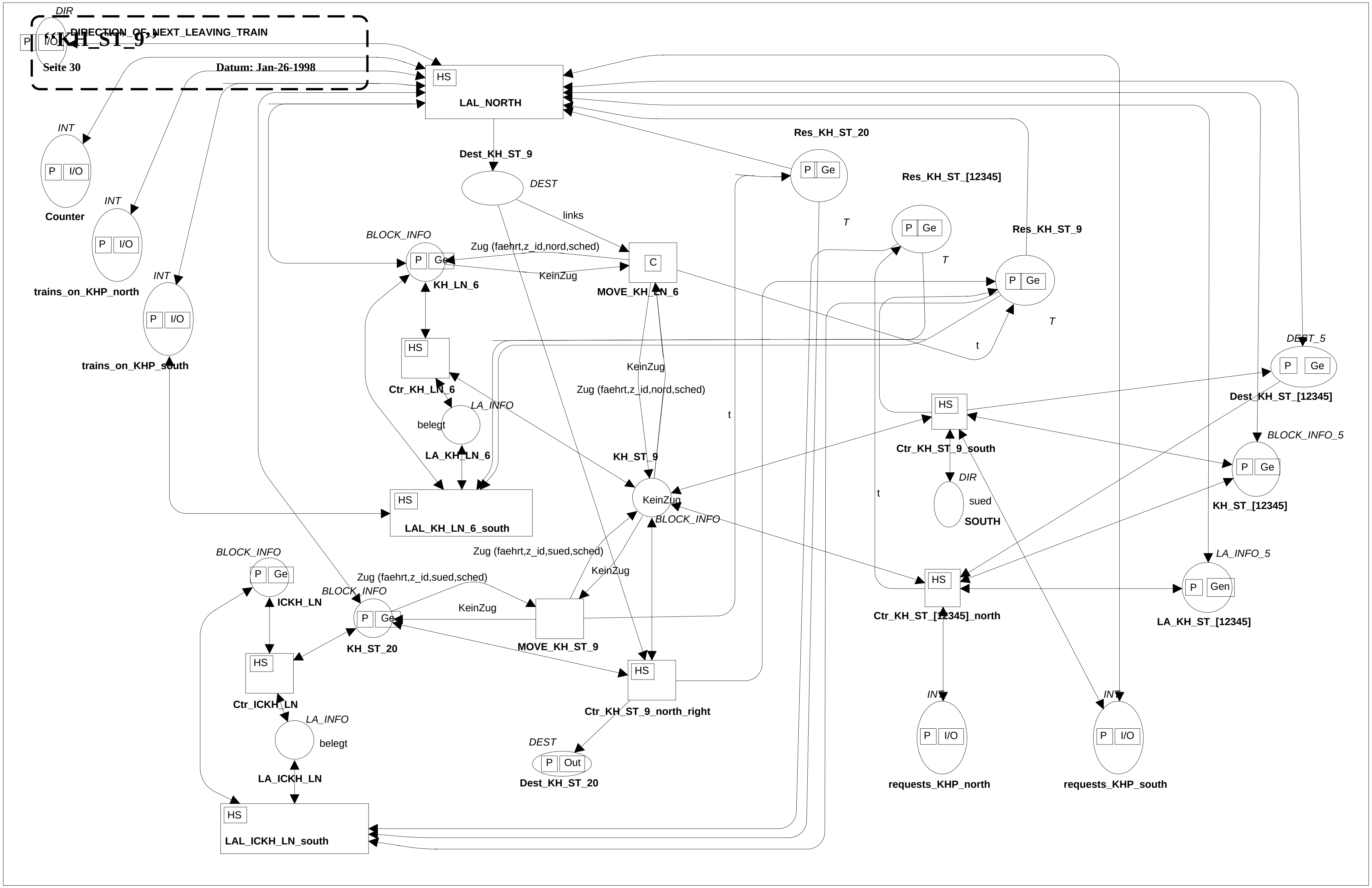
Seite 40 **Datum: Jan-26-1998**

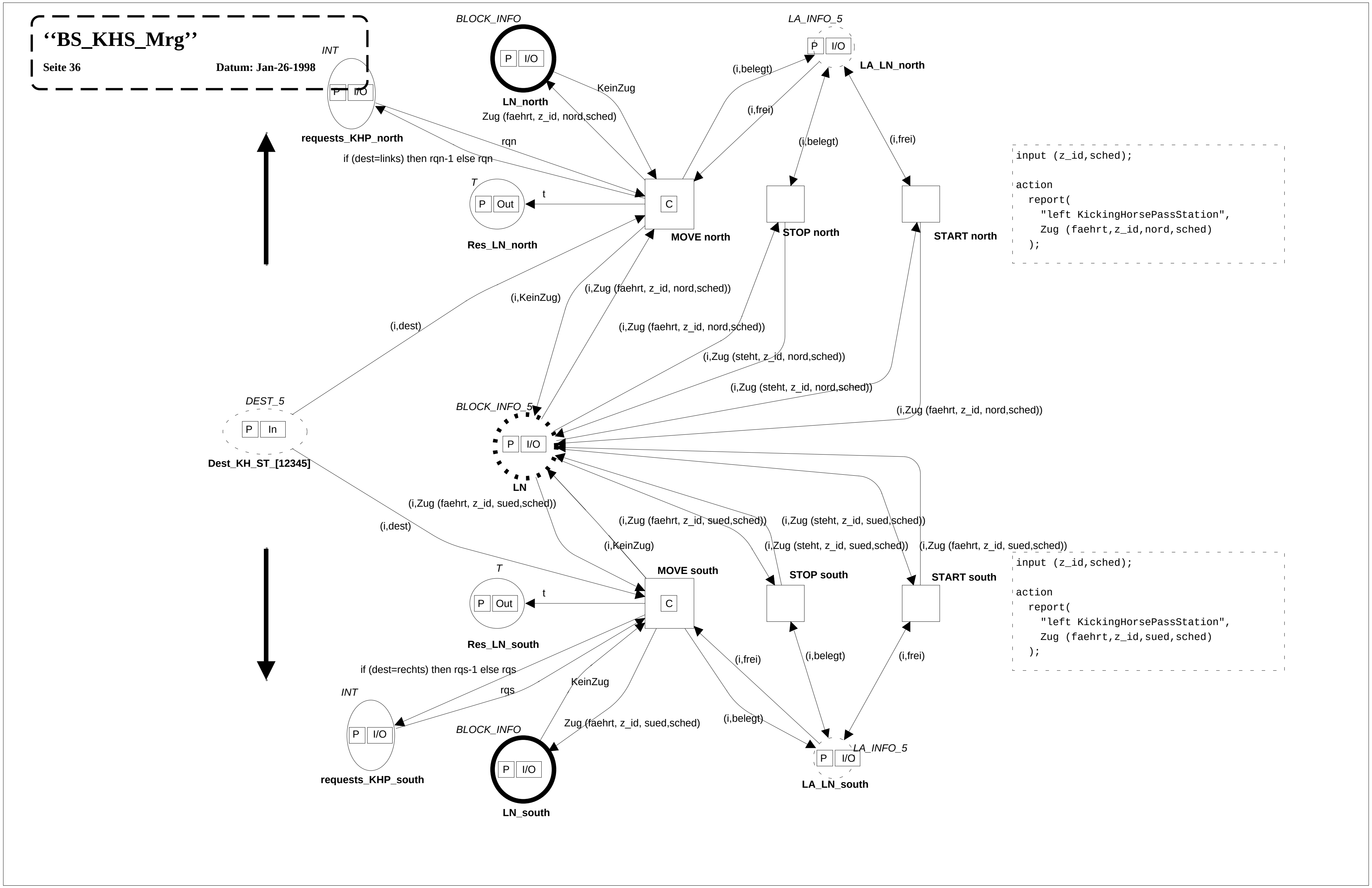


‘‘Ctr_KH_ST_9_north_right’’

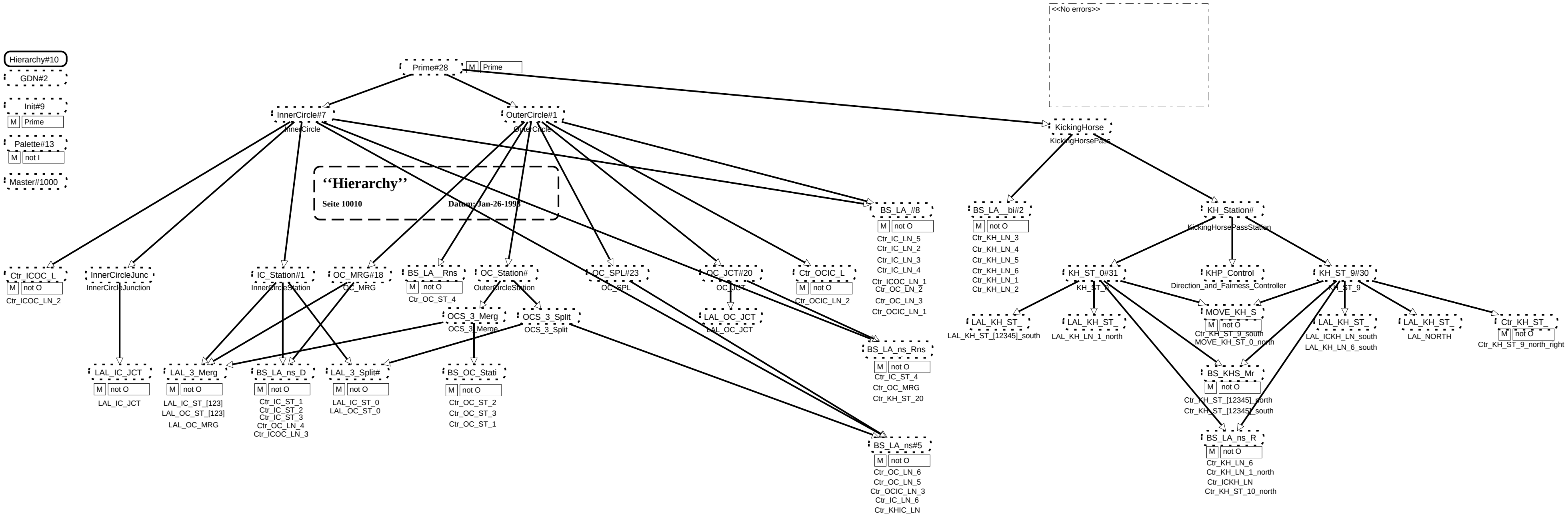
Seite 39 **Datum: Jan-26-1998**




"KH_ST_9"
DIRECTION_OF_NEXT_LEAVING_TRAIN
Seite 30
Datum: Jan-26-1998
DIR
P I/O
HS
LAL_NORTH
INT
P I/O
Counter
INT
P I/O
trains_on_KHP_north
INT
P I/O
trains_on_KHP_south
Dest_KH_ST_9
DEST
links
BLOCK_INFO
P Ge
KH_LN_6
Zug (faehrt,z_id,nord,sched)
KeinZug
C
MOVE_KH_LN_6
HS
Ctr_KH_LN_6
LA_INFO
belegt
LA_KH_LN_6
HS
LAL_KH_LN_6_south
KeinZug
Zug (faehrt,z_id,nord,sched)
KH_ST_9
KeinZug
BLOCK_INFO
Res_KH_ST_20
P Ge
Res_KH_ST_[12345]
P Ge
Res_KH_ST_9
P Ge
T
T
T
t
t
t
DEST_5
P Ge
Dest_KH_ST_[12345]
HS
Ctr_KH_ST_9_south
DIR
sued
SOUTH
BLOCK_INFO_5
P Ge
KH_ST_[12345]
HS
Ctr_KH_ST_[12345]_north
LA_INFO_5
P Gen
LA_KH_ST_[12345]
BLOCK_INFO
P Ge
ICKH_LN
Zug (faehrt,z_id,sued,sched)
Zug (faehrt,z_id,sued,sched)
KeinZug
KeinZug
BLOCK_INFO
P Ge
KH_ST_20
MOVE_KH_ST_9
HS
Ctr_ICKH_LN
LA_INFO
belegt
LA_ICKH_LN
HS
Ctr_KH_ST_9_north_right
DEST
P Out
Dest_KH_ST_20
HS
LAL_ICKH_LN_south
INT
P I/O
requests_KHP_north
INT
P I/O
requests_KHP_south



''BS_KHS_Mrg''
Seite 36
Datum: Jan-26-1998
INT
requests_KHP_north
BLOCK_INFO
LN_north
Zug (faehrt, z_id, nord,sched)
KeinZug
LA_INFO_5
LA_LN_north
(i,belegt)
(i,frei)
rqn
if (dest=links) then rqn-1 else rqn
T
Res_LN_north
t
MOVE north
STOP north
START north
input (z_id,sched);
action
report(
"left KickingHorsePassStation",
Zug (faehrt,z_id,nord,sched)
);
(i,KeinZug)
(i,Zug (faehrt, z_id, nord,sched))
(i,dest)
(i,Zug (steht, z_id, nord,sched))
DEST_5
Dest_KH_ST_[12345]
BLOCK_INFO_5
LN
(i,Zug (faehrt, z_id, sued,sched))
(i,Zug (steht, z_id, sued,sched))
MOVE south
STOP south
START south
input (z_id,sched);
action
report(
"left KickingHorsePassStation",
Zug (faehrt,z_id,sued,sched)
);
Res_LN_south
if (dest=rechts) then rqs-1 else rqs
rqs
KeinZug
Zug (faehrt, z_id, sued,sched)
requests_KHP_south
LN_south
LA_LN_south



''Hierarchy''
Seite 10010
Datum: Jan-26-1998
<<No errors>>
Hierarchy#10
GDN#2
Init#9
M Prime
Palette#13
M not I
Master#1000
Prime#28
M Prime
InnerCircle#7
InnerCircle
OuterCircle#1
OuterCircle
KickingHorse
KickingHorsePass
Ctr_ICOC_L
M not O
Ctr_ICOC_LN_2
InnerCircleJunc
InnerCircleJunction
LAL_IC_JCT
M not O
LAL_IC_JCT
IC_Station#1
InnerCircleStation
OC_MRG#18
OC_MRG
BS_LA__Rns
M not O
Ctr_OC_ST_4
OC_Station#
OuterCircleStation
OCS_3_Merg
OCS_3_Merge
OCS_3_Split
OCS_3_Split
LAL_3_Merg
M not O
LAL_IC_ST_[123]
LAL_OC_ST_[123]
LAL_OC_MRG
BS_LA_ns_D
M not O
Ctr_IC_ST_1
Ctr_IC_ST_2
Ctr_IC_ST_3
Ctr_OC_LN_4
Ctr_ICOC_LN_3
LAL_3_Split#
M not O
LAL_IC_ST_0
LAL_OC_ST_0
BS_OC_Stati
M not O
Ctr_OC_ST_2
Ctr_OC_ST_3
Ctr_OC_ST_1
OC_SPL#23
OC_SPL
OC_JCT#20
OC_JCT
LAL_OC_JCT
LAL_OC_JCT
Ctr_OCIC_L
M not O
Ctr_OCIC_LN_2
BS_LA_#8
M not O
Ctr_IC_LN_5
Ctr_IC_LN_2
Ctr_IC_LN_3
Ctr_IC_LN_4
Ctr_ICOC_LN_1
Ctr_OC_LN_2
Ctr_OC_LN_3
Ctr_OCIC_LN_1
BS_LA_ns_Rns
M not O
Ctr_IC_ST_4
Ctr_OC_MRG
Ctr_KH_ST_20
BS_LA_ns#5
M not O
Ctr_OC_LN_6
Ctr_OC_LN_5
Ctr_OCIC_LN_3
Ctr_IC_LN_6
Ctr_KHIC_LN
BS_LA__bi#2
M not O
Ctr_KH_LN_3
Ctr_KH_LN_4
Ctr_KH_LN_5
Ctr_KH_LN_6
Ctr_KH_LN_1
Ctr_KH_LN_2
KH_Station#
KickingHorsePassStation
KH_ST_0#31
KH_ST_0
KHP_Control
Direction_and_Fairness_Controller
KH_ST_9#30
KH_ST_9
LAL_KH_ST_
LAL_KH_ST_[12345]_south
LAL_KH_ST_
LAL_KH_LN_1_north
MOVE_KH_S
M not O
Ctr_KH_ST_9_south
MOVE_KH_ST_0_north
LAL_KH_ST_
LAL_ICKH_LN_south
LAL_KH_LN_6_south
LAL_KH_ST_
LAL_NORTH
Ctr_KH_ST_
M not O
Ctr_KH_ST_9_north_right
BS_KHS_Mr
M not O
Ctr_KH_ST_[12345]_north
Ctr_KH_ST_[12345]_south
BS_LA_ns_R
M not O
Ctr_KH_LN_6
Ctr_KH_LN_1_north
Ctr_ICKH_LN
Ctr_KH_ST_10_north